Vol. 949 Number 3

H-Y

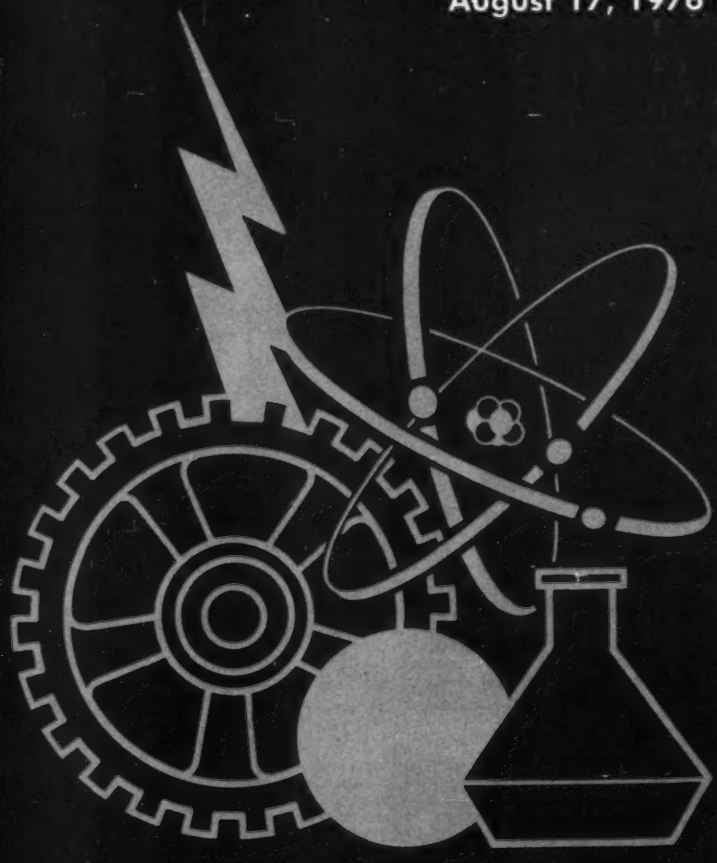
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 17, 1976



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 17, 1976 Volume 949 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Registration to Practice	858
National Inventors Day	858
Patent Suits	858
Patent Notices	
Certificates of Correction for the Week of August 17, 1976	859
Dedications	859
Disclaimers	859
Condition of Patent Applications	860
Reissue Patents Granted (28,929)	861
Plant Patents Granted (3,940)	864
Patents Granted	
General and Mechanical (3,974,525)	865
Chemical (3,975,150)	1077
Electrical (3,975,575)	1191
Design Patents Granted (240,970)	1261
Index of Patentees	PI 1
Index of Reissue Patentees	PI 41
Index of Plant Patentees	PI 41
Index of Design Patentees	PI 41
Classification of	
Patents (Including Reissues)	PI 45
Designs and Plants	PI 47
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 48
Designs and Plants	PI 50

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum for first class mailing, also available as fourth-class mail at $250.00; foreign mailing $85.55 additional: single copies $6.60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before September 17, 1976.

Anderson, William C., 509 Tenn. Ave., Alexandria, Va. 22305
Ebel, Jack E., 100 S. Van Dorn St., C417, Alexandria, Va. 22304
Gittes, Franklin M., 323 Gill Lane, Apt. 10E, Iselin, N.J. 08830
Lever, Jack Q., Jr., 5917 Conway Rd., Bethesda, Md. 20034

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

National Inventor's Day

The 5th Annual Inventor's Day Exposition will be held on Saturday and Sunday, February 5 and 6, 1977 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by prospective participants. No application can be considered after December 1, 1976.

Other than electricity and alloted space—floor, wall or table top—all expenses associated with each exhibit are to be borne by the exhibitor. Arrangements for delivery, return, setup, and teardown as well as individual exhibit personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office, nor individual employees, can accept a collect shipment or provide storage.

The Patent and Trademark Office has established a committee which will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interests are prime considerations in selecting exhibits.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
Chairman.

June 14, 1976.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,032,510, Tornqvist and Langer, Jr., POLYMERIZATION CATALYST; **3,128,252,** Tornqvist, Seelbach and Langer, Jr.; PREPARATION OF PARTIALLY REDUCED TRANSITION METAL HALIDE CATALYST COMPOSITIONS; **3,252,960,** same, POLYMERIZATION PROCESS AND PRODUCTS THEREOF; **3,814,743,** Tornqvist and Langer, Jr., PROCESS FOR POLYMERIZING ALPHA-OLEFINS, **filed** Mar. 23, 1976, D.C., S.D. Tex. (Houston) Doc. 76–H–483, *Exxon Research & Engineering Co.* v. *Standard Oil Co.* **Same, filed** Mar. 23, 1976, D.C. Del. (Wilmington) Doc. 76–116, *Amoco Chemicals Corporation* v. *Exxon Research & Engineering Co.*

3,128,252. (See 3,032,510.)

3,252,960. (See 3,032,510.)

3,327,664, Bryan and Haselgrove, AUTOMATIC TOE-CLOSING OF STOCKINGS; **3,429,284,** L.T.F. Bryan, same, **filed** Mar. 17, 1976, D.C. N.C. (Charlotte) Doc. C–C–76–96, *Detexomat Machinery Ltd.* v. *Precision Pantyhouse Equipment Corp. et al.*

3,398,745, Tjerneld and Hook, DEVICE FOR THE TAPPING OF URINE AND SIMILAR PURPOSES, **filed** Mar. 17, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–780–FW, *Aktiebolaget Stille-Werner* v. *Medar and Zeb. Wishard.*

3,414,254, Snellman and Keeler, SHEET COLLATING DEVICE, **filed** Mar. 16, 1976, D.C. Colo. (Denver) Doc. 76–F–293, *Norfin, Inc.* v. *International Business Machines Corporation.*

3,420,642, G. Percival, PRODUCTION OF GASES CONTAINING METHANE FROM HYDROCARBONS, **filed** Mar. 19, 1976, D.C. Conn. (Bridgeport) Doc. B–76–86, *Lurgi Mineraloltechnik GmbH* v. *British Gas Corporation.*

3,429,284. (See 3,327,664.)

3,445,324, Curler and Lineburg, FLEXIBLE WRAPPING MATERIAL, **filed** Mar. 22, 1976, D.C., E.D. Wis. (Milwaukee) Doc. 76–201, *Milprint, Inc.* v. *Curwood, Inc.*

3,476,232, Merwin and Weiss, PERMANENT MAGNETIC CONVEYOR AND ELEVATOR, **filed** Oct. 7, 1975, D.C., E.D. Mich. (Detroit) Doc. 75–71933, *Eriez Manufacturing Company* v. *Livonia Magnetics, Inc.* Judgment, defendant's motion for summary judgment is granted and the complaint is dismissed with prejudice, Mar. 18, 1976.

3,593,930, R. D. Lautzenheiser, SHREDDER, **filed** June 30, 1972. D.C., N.D. Ill. (Chicago) Doc. 72–C–1625, *Red Cross Manufacturing Corp.* v. *Toro Sales Company.* Final order and consent judgment, defendant is hereby enjoined from manufacture, use or sale of previously identified rotary shredding devices and other devices which come within the claims of the patent in suit, Mar. 22, 1976.

3,617,951, R. Anderson, BROADBAND CIRCULATOR OR INSOLATOR OF THE STRIP LINE OR MICROSTRIP TYPE, **filed** Mar. 17, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–552–OJC, *Western Microwave Laboratories, Inc.* v. *RYT Industries Inc.*

3,630,066, F. L. Chisum, APPARATUS FOR RETURNING VEHICLE BODY AND FRAME COMPONENTS TO THEIR ORIGINAL LOCATIONS DURING REPAIR AND SERVICING OF VEHICLES, **filed** Mar. 26, 1976, D.C. Minn. (Minneapolis) Doc. 4–76–C 134, *Square Liner 360° Inc.* v. *Finis Lavell Chisum and Chisum Products Company, Inc. and Chief Industries, Inc.*

3,648,939, K. I. J. Rosen, YARN STORING DEVICE, **filed** Feb. 11, 1976, United States Court of Appeals, First Circuit, Mass. (Boston) Doc. 76–1069, *Karl Isac Joel Rosen and Ab Iro* v. *Lawson-Hemphill, Inc.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Mar. 24, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–141–G, *Tights, Inc.* v. *Aladdin Knit Mills, Inc. (Division of Kellwood Company).* **Same, filed** Mar. 24, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–142–S, *Tights, Inc.* v. *Cabarrus Hosiery Company.* **Same, filed** Mar. 24, 1976, D.C., M.D.N.C. (Greensboro) Doc. C–76–143–G, *Tights, Inc.* v. *Slane Hosiery Mills, Inc.*

3,766,851, Sirvet, Skrypek and Whelan, CONTINUOUS CAN PRINTER AND HANDLING APPARATUS, **filed** Mar. 19, 1976, D.C.N.J. (Newark) Doc. 74–1895, *Sun Chemical Corporation* v. *Van Vlaanderen Container Machinery, Inc.*

3,814,743. (See 3,032,510.)

3,906,820, E. D. Hauk, APPARATUS AND METHOD FOR SPINNING PIPE, **filed** Mar. 24, 1976, D.C., S.D. Tex. (Houston), Doc. 76–H–486, *Service Equipment Design Co.* v. *Gator Hawk External Testers, Inc. and Gator Hawk Testing Service, Inc.*

PATENT NOTICES

Certificates of Correction for the Week of Aug. 17, 1976

P.P. 3,873	3,917,319	3,945,627	3,954,576
3,511,988	3,919,322	3,946,025	3,954,834
3,674,737	3,919,419	3,946,219	3,954,903
3,742,369	3,923,378	3,946,727	3,955,354
3,771,873	3,924,616	3,946,734	3,955,532
3,773,384	3,927,587	3,947,169	3,956,167
3,803,120	3,927,885	3,947,432	3,956,179
3,814,725	3,928,457	3,948,387	3,956,487
3,828,252	3,928,466	3,948,629	3,957,354
3,829,423	3,929,862	3,948,669	3,957,885
3,836,560	3,930,719	3,948,711	3,957,990
3,839,693	3,932,486	3,948,800	3,958,032
3,846,260	3,932,662	3,948,883	3,958,108
3,848,494	3,932,664	3,948,933	3,958,679
3,850,313	3,933,576	3,950,319	3,958,711
3,853,793	3,933,793	3,950,523	3,959,159
3,856,147	3,934,079	3,950,578	3,959,338
3,857,741	3,934,165	3,950,947	3,959,450
3,859,323	3,934,471	3,951,429	3,959,757
3,861,415	3,935,204	3,951,854	3,959,905
3,862,944	3,936,285	3,952,049	3,960,205
3,864,469	3,936,363	3,952,187	3,960,271
3,867,372	3,937,069	3,952,285	3,960,623
3,870,502	3,940,293	3,952,640	3,960,813
3,879,196	3,940,404	3,953,285	3,960,871
3,891,768	3,941,606	3,953,542	3,961,670
3,897,674	3,943,154	3,953,713	3,961,748
3,899,525	3,943,836	3,953,961	3,961,829
3,915,852	3,944,122	3,954,189	3,962,165
3,915,938	3,944,799	3,954,307	3,962,470
3,915,953	3,944,905	3,954,388	3,962,669
3,917,006	3,944,997	3,954,545	3,963,149

Dedications

3,155,273.—*Raymond A. Cote,* Metuchen, N.J. CARTON FOR TISSUES. Patent dated Nov. 3, 1964. Dedication filed Dec. 17, 1974, by the assignee, *International Paper Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,774,430.—*Walter L. Greer, Lynwood,* and *Richard C. Schlicht,* Seal Beach, Calif. METAL FORMING. Patent dated Nov. 27, 1973. Dedication filed June 17, 1976, by the assignee, *The Garrett Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,892,091.—*Alma A. Hutchins,* Pasadena, Calif. ABRADING TOOL UTILIZING A SELF ADHESIVE ABRADING SHEET. Patent dated July 1, 1975. Dedication filed June 17, 1976, by the assignee, *Minnesota Mining and Manufacturing Company.*

Hereby dedicates said patent to the Public.

Disclaimers

Design No. 235,286.—*Arnold C. Martinelli,* Rawdon, Quebec, Canada. CHAIR. Patent dated June 10, 1975. Disclaimer filed June 23, 1976, by the Inventor.

Hereby enters this disclaimer to the claim of said patent.

3,173,583.—*Eugene A. Wahl,* Glen Ridge, N.J. BIN ACTIVATOR. Patent dated Mar. 16, 1965. Disclaimer filed May 24, 1976, by the Inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,668,658.—*Ralph Flores,* San Jose, and *Herbert E. Thompson,* Santa Clara, Calif. MAGNETIC RECORD DISK COVER. Patent dated June 6, 1972. Disclaimer filed June 7, 1976, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claim 2 of said patent.

3,698,043.—*John H. Batts,* Grand Rapids, Mich. MOLDED GARMENT CLAMP. Patent dated Oct. 17, 1972. Disclaimer filed June 10, 1976, by the assignee, *John Thomas Batts, Inc.*

The term of this patent subsequent to May 30, 1989, has been disclaimed.

3,739,217.—*Arpad A. Bergh,* Murray Hill, and *Robert H. Saul,* Scotch Plains, N.J. SURFACE ROUGHENING OF ELECTROLUMINESCENT DIODES. Patent dated June 12, 1973. Disclaimer filed June 9, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1 through 6 of said patent.

3,761,534.—*Yun Chung Sun* and *Richard T. Dickerson,* Midland, Mich. REMOVAL OF ACIDIC CONTAMINANTS FROM PROCESS STREAMS. Patent dated Sept. 25, 1973. Disclaimer filed Apr. 23, 1975, by the assignee, *The Dow Chemical Company.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,776,642.—*James H. Anson,* Suburn, and *Donald E. O'Neal,* Springfield, Ill. GRAIN ANALYSIS COMPUTER. Patent dated Dec. 4, 1973. Disclaimer filed June 24, 1976, by the assignee, *Dickey-John Corporation.*

Hereby enters this disclaimer to claims 28 and 29 of said patent.

3,927,149.—*Odd Kristiansen,* Mohlin, Switzerland. O-(METHYL OR ETHYL)-O (8) LOWER ALKYL-O-(4-PHENOXYPHENYL) PHOSPHATES. Patent dated Dec. 16, 1975. Disclaimer filed June 16, 1976, by the assignee, *Ciba-Geigy Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

3,952,223.—*Saul Kuchinsky,* Somerville, N.J., *Roger W. Wolfe,* San Diego, Calif., and *Thomas C. Maloney,* Bernardsville, and *William M. Hennessey,* Somerville, N.J. MULTIPLE CHARACTER FLAT PANEL DISPLAY DEVICE. Patent dated Apr. 20, 1976. Disclaimer filed June 14, 1976, by the assignee, *Burroughs Corporation.*

The term of this patent subsequent to Feb. 25, 1992, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 30, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-1-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-17-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-3-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	9-19-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-2-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-6-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	4-14-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-24-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	2-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-15-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants: Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,893,005 to 2,597,499 inclusive
Plant Patents..... Numbers 1,850 to 1,855 inclusive

REISSUES

AUGUST 17, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,929

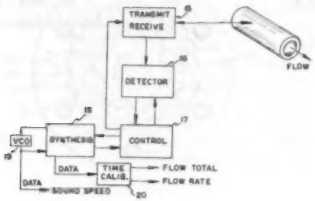
ULTRASONIC FLUID SPEED OF SOUND AND FLOW METER APPARATUS AND METHOD

Alvin E. Brown, Claremont, Calif., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Original No. 3,780,577, dated Dec. 25, 1973, Ser. No. 268,712, July 3, 1972. Application for reissue July 29, 1975, Ser. No. 599,980

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **25 Claims**



1. In an ultrasonic speed of sound and flow meter system of the type utilizing first and second transducers spaced in relative upstream-downstream positions in communication with the fluid to be metered, means for generating signals to be transmitted by said transducers through said fluid, means for receiving signals sensed by said transducers, means for generating a reference signal, means for comparing the phase of the received signal and the reference signal and generating a phase dependent signal, means responsive to said phase dependent signal for generating signal levels proportional to upstream and downstream speeds of sound, means responsive to said signal levels for providing frequencies proportional to upstream and downstream speeds of sound, control means utilizing said frequencies for directing transmission alternately by said first and second transducer and reception alternately by said second and first transducer respectively, and means combining said frequencies whereby a sum frequency is obtained proportional to the speed of sound in the medium and a difference frequency is obtained proportional to the flow rate of the medium.

Re. 28,930

REMOVABLE INSULATED PIPE JACKET

Lowell Johnson, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.

Original No. 3,818,949, dated June 25, 1974, Ser. No. 329,594, Feb. 5, 1973. Application for reissue Nov. 21, 1974, Ser. No. 525,924

Int. Cl.[2] F16L *59/14*

U.S. Cl. 138—158 **3 Claims**

1. A prefabricated removable insulated pipe jacket consisting of two mating semicircular longitudinal sections with each section comprising

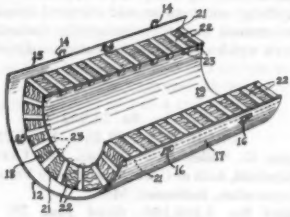
a. a semicircular outer metallic cover,

b. a batt of insulation material conforming to the configuration of said cover and of a size less than said cover and positioned on the inner surface thereof exposing one end and edge of said cover,

c. an interior protective sheet over the entire inner surface of said batt of insulation,

d. [an elongated connector strip providing spaced flange members extending at right angles therefrom with said flanges being equal in length to the thickness of said batt of insulation.]

[e.] means [provided by said first-mentioned means for] *embracing the edges of said batt of insulation* connecting said cover to said interior protective sheet to either side of said batt of insulation while providing a minimum of heat transfer contact between said cover and said interior sheet,



e. said means including an elongated connector strip providing spaced flange members extending at right angles therefrom with said flanges being equal in length to the thickness of said batt of insulation,

f. said flange members providing tabs at the free ends thereof adapted to be connected to a confronting surface of said protective sheet when said connector strip is connected to a confronting surface of said cover,

g. and means for releasably securing the exposed longitudinal edge of two mating sections together to form a circular jacket for the pipe.

Re. 28,931

METHOD AND APPARATUS FOR SEPARATING SELECTED CIGARETTES OR ANALOGOUS ROD-SHAPED ARTICLES FROM A SERIES OF RAPIDLY MOVING EQUIDISTANT ARTICLES

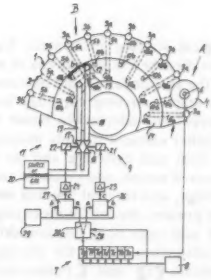
Frank-Dieter Lehmann, Wentorf, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Original No. 3,720,310, dated Mar. 13, 1973, Ser. No. 120,293, Mar. 2, 1971. Application for reissue Mar. 5, 1975, Ser. No. 555,621

Claims priority, application Germany, Mar. 5, 1970, 2010392

Int. Cl.[2] B07C *3/04*

U.S. Cl. 209—74 M **45 Claims**



1. In a method of individually removing selected cigarettes or analogous rod-shaped articles from a predetermined path for a series of equidistant discrete articles moving at an ele-

vated speed and forming at least two groups, the articles of one of said groups alternating with the articles of another of said groups and the removal of selected articles being effected by a separating force to the action of which a selected article is subjected in response to a signal, the steps of transmitting signals for removal of selected articles of said one group along a first route; transmitting signals for removal of selected articles of said other group along a second route; starting the action of said separating force in response to the thus transmitted signals and in a direction which crosses said path at a point coinciding with the locus of the respective selected article; and moving said point of application of said separating force along said path at said elevated speed and through a predetermined distance substantially exceeding the distance between a pair of neighboring articles of said series.

Re. 28,932

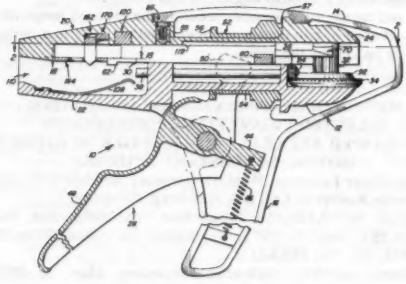
SURGICAL STAPLING INSTRUMENT

Douglas G. Noiles, New Canaan, and Graham W. Bryan, Ridgefield, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Original No. 3,819,100, dated June 25, 1974, Ser. No. 293,470, Sept. 29, 1972. Application for reissue May 8, 1975, Ser. No. 575,580

Int. Cl.[2] B25C *5/02*

U.S. Cl. 227—19 **22 Claims**



1. A surgical stapling instrument for applying sterilized staples to the disunited skin or fascia of a patient for effecting a joining of the skin or fascia, the instrument adapted to associate with a staple-carrying cartridge having anvil means at one end thereof and adapted to house a plurality of staples therein, a pusher element slidably mounted therein for ejecting staples from said cartridge and for forming said staples around said anvil means, and means for advancing said staples in said cartridge, said surgical stapling instrument comprising: a main body portion; means for mounting said staple-carrying cartridge on said main body portion; drive means to activate said staple-advancing means for driving the staples toward said anvil means [;] and [pusher-activating means] for driving the pusher element forward to eject a staple from the staple-carrying cartridge and to form said staple around said anvil means; said instrument being manually powered, and further comprising trigger means for transmitting a manually applied force to said drive means [and said pusher-activating means] to power said drive means [and said pusher-activating means].

Re. 28,933

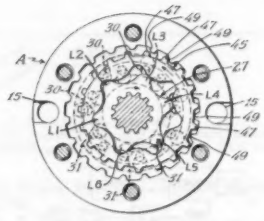
HYDRAULIC TORQUE MOTOR

Mortimer J. Huber, White Bear Lake, Minn., assignor to Gresen Manufacturing Company, Minneapolis, Minn.

Original No. 3,391,608, dated July 9, 1968, Ser. No. 564,086, July 11, 1966. Application for reissue Dec. 17, 1970, Ser. No. 99,330

Int. Cl.[2] F01C *1/02*

U.S. Cl. 418—61 B **34 Claims**



1. A hydraulic motor includes a housing defining a motor chamber, a rotor supported for rotation upon a shaft within said chamber, said rotor having angularly spaced external lobes thereupon, an orbital member encircling said rotor, internal lobes on said orbital member cooperable with the external lobes of said rotor, the number of internal lobes exceeding by one the number of external rotor lobes, and said housing having pairs of inlet and outlet ports, said inlet ports communicating with the areas between said lobes on said orbital member and rotor as these areas are increasing in size and being closed by said orbital member as said areas are decreasing in size and said outlet ports communicating with said areas as said areas decreasing in size and closed by said orbital member as said areas are increasing in size, and means on said orbital member directly engaging said rotor housing for holding said orbital member from rotation about the axis of said rotor.

Re. 28,934

PHOTOGRAPHIC DEVELOPER COMPOSITION CONTAINING FORMALDEHYDE BISULFITE ALKANOLAMINE CONDENSATION PRODUCT AND FREE ALKANOLAMINE

Thomas J. Masseth, Sweden, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,573,914, dated Apr. 6, 1971, Ser. No. 661,532, Aug. 18, 1967. Continuation-in-part of Ser. No. 583,935, Oct. 3, 1966, abandoned. Application for reissue Jan. 7, 1976, Ser. No. 647,299

Int. Cl.[2] G03C *5/30*

U.S. Cl. 96—66.4 **17 Claims**

1. A liquid photographic developer composition comprising:

(a) a *dihydroxybenzene* silver halide developing agent,

(b) a [carbonyl] *formaldehyde* bisulfite-alkanolamine condensation product, and

(c) at least about 0.075 mole of free alkanolamine per liter of developer composition.

Re. 28,935

5-PHENYL-7-CHLORO-1H-1,5-BENZODIAZEPINE-2,4-(3H,5H)-DIONES

Karl-Heinz Weber, Gau-Algesheim; Karl Zeile; Peter Danneberg, both of Ingelheim am Rhein, Rolf Glesemann, Bingen, all of Germany; Karl Heinz Hauptmann, deceased, late of Ingelheim am Rhein, Germany, by Maria Hauptmann, heiress, Bonn, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

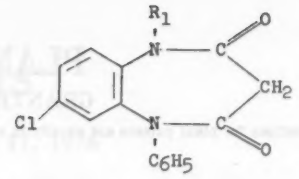
Original No. 3,684,798, dated Aug. 15, 1972, Ser. No. 111,716, Feb. 1, 1971. Continuation-in-part of Ser. No. 89,482, Nov. 13, 1970, abandoned, which is a continuation of Ser. No. 703,188, Feb. 5, 1968, abandoned. Application for reissue June 17, 1975, Ser. No. 587,591

Claims priority, application Germany, Feb. 7, 1967, B 91071; Jan. 18, 1968, B 96281; Jan. 18, 1968, B 96282

Int. Cl.² C07D *243/12*

U.S. Cl. 260—239.3 B 8 Claims

1. A compound of the formula



wherein R_1 is hydroxy-alkyl of 2 to 4 carbon atoms; haloalkyl of 2 to 4 carbon atoms; di(alkyl of 2 to 4 carbon atoms)amino-alkyl of 2 to 4 carbon atoms; γ-piperidino-propyl; alkoxy of 1 to 2 carbon atoms-alkyl of 1 to 4 carbon atoms; (alkoxy of 1 to 2 carbon atoms)carbonyl-alkyl of 1 to 4 carbon atoms; (alkyl of 1 to 2 carbon atoms)mercaptoalkyl of 1 to 4 carbon atoms; [straight or branched alkenyl of 3 to 5 carbon atoms;] (alkoxy of 1 to 2 carbon atoms)carbonyl-alkenyl of 2 to 4 carbon atoms; or halo-alkenyl of 2 to 4 carbon atoms.

PLANT PATENTS

GRANTED AUGUST 17, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,940

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Aug. 18, 1975, Ser. No. 605,763

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy dwarf, rounded, much branched, bush type as illustrated and described, characterized by buds and flowers resembling the Windy City (patent applied for) miniature rose in general form but color is more red rather than pink and flowers tend to open better, the general color effect being light to medium red; and further characterized by a plant which is of vigorous and compact growth, easy to propagate from cuttings, with medium small semi-glossy to glossy foliage and an abundancy of bloom, with flowers borne singly or several to stem in loose clusters.

PATENTS

GRANTED AUGUST 17, 1976

ERRATA

For CLASS	See PATENT NO.
004–112	3,974,533
273–105.2	3,974,799
251–309	3,974,869
280–733	3,975,258
209–073	3,975,260
209–074 M	3,975,261
209–11.6	3,975,262
526–015	3,975,332
526–019	3,975,334
526–283	3,975,335
525–335	3,975,336
526–341	3,975,337
526–345	3,975,338
526–347	3,975,339
526–312	3,975,340
526–303	3,975,341
424–260	3,975,368
536–017	3,975,372
536–007	3,975,373
536–023	3,975,374
333–033	3,975,581
179–001 SA	3,975,587
179–001 FS	3,975,588
179–002 AM	3,975,589
240–102 R	3,975,627
354–028	3,975,677
346–076 R	3,975,707
358–078	3,975,748
358–065	3,975,766

PATENTS

GRANTED AUGUST 17, 1976

GENERAL AND MECHANICAL

3,974,525

METHOD OF KNITTING SOCKS HAVING A CLOSED TOE

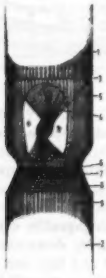
Josephus Johannes Maria Jansen, Schijndel, Netherlands, assignor to Koninklijke Textielfabrieken, Schijndel, Netherlands

Filed Feb. 6, 1975, Ser. No. 547,457

Claims priority, application Netherlands, Feb. 19, 1974, 7402256

Int. Cl.² D04D *9/56*

U.S. Cl. 2—61 2 Claims



1. In a method for knitting socks of a circular knitting machine in a connected string of such socks which includes,

knitting a length of double fabric comprised of internal and external fabric parts to the toe portion of one sock, joining the edges of said internal and external fabrics together,

continuing the knitting with a first series of courses of a heat shrinkable yarn and then a second series of courses of a washable yarn, and thereafter starting knitting of the welt of the next sock in the string, immersing the string in a heated bath of a liquid which is a solvent of said washable yarn, which concurrently causes said washable yarn to disappear severing the socks one from the other and the shrinkable yarn to shrink whereby the toe portion of each sock is cast off run-free.

3,974,526

VASCULAR PROSTHESES AND PROCESS FOR PRODUCING THE SAME

Irving I. Dardik, 130 DeVriese Court, Tenafly, N.J. 07670, and Herbert Dardik, 806 Washburn St., Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 376,948, July 6, 1973, Pat. No. 3,894,530. This application Jan. 23, 1975, Ser. No. 543,462

Int. Cl.² A61F *1/24;* A61B *19/00*

U.S. Cl. 3—1.4 39 Claims

37. A tubular prosthesis for repairing, augmenting or replacing a vein or artery of a mammal comprising an umbilical cord essentially free of blood and having therein a vein in distended condition.

3,974,527

ARTIFICIAL HIP-JOINT FOR ARTHROPLASTY

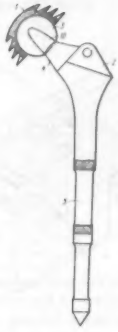
Yakov Isaevich Shershier, 1 Degtyarny pereulok, 3, kv. 42, Saratov, U.S.S.R.

Filed Nov. 14, 1974, Ser. No. 523,794

Claims priority, application U.S.S.R., Nov. 19, 1973, 1967205

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.912 2 Claims



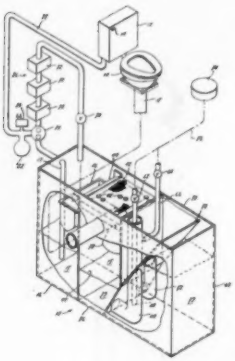
1. An artificial hip-joint for arthroplasty, such for the replacement of the affected actabulum and the head of the femur of a patient, comprising a first endoprosthesis of the acetabulum, formed as a seat having an exterior surface and an interior surface; said exterior surface being defined by blades with sharpened edges and apertures through which growing bony tissue may protrude; said blades being arranged in circular rows that are in turn arranged in axially disposed tiers, one above the other; said interior surface of the seat having the shape of a sphere with a cavity that has a height greater than its radius but smaller than its diameter; a second endoprosthesis of the proximal portion of the femur, coupled with said seat and including a spherical head, a neck and a pin; said head has a radius corresponding to that of first endoprosthesis, for location of said head therein; the latter including a blind, substantially central opening for receiving said neck made in a body portion of said sphere; the exterior spherical surface of said head at the side of said opening having a cylindrical portion of a radius smaller than that of said sphere, to allow for the introduction of the head into said first endoprosthesis; said cylindrical portion being such that, at the introduction of said neck into said opening, it is positioned along the axis of said opening, eccentrically of said spherical head; said opening having an open end located at the side of said cylindrical portion; said pin being connected by one end through said neck with said spherical head, and being adapted to be introduced with its other end into the intraosseal canal of the femur.

3,974,528

SEWAGE SYSTEM WITH REUSABLE FLUSH MEDIUM

Robert W. Claunch; Thomas N. Deane; Patrick D. M. Rogan, all of New Orleans; Carl M. Powe, and Mark Werner, both of Slidell, all of La., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 7, 1975, Ser. No. 602,698
Int. Cl.[2] E03D 3/00, 5/016, 5/01
U.S. Cl. 4—10 20 Claims



1. A sewage system for separating sewage waste from a flush medium so the medium can be reused, comprising:

a non-aqueous liquid flush medium for receiving and transporting sewage waste, the flush medium having a specific gravity less than that of water,

a separating tank for receiving sewage waste being transported by the flush medium, the flush medium separating from the waste upon entering the separating tank and floating on the waste due to its different specific gravity whereby an upper flush medium containing section and a lower waste containing section are established in the separating tank with an intermediate interface,

flush medium outlet means positioned in the upper section of the separating tank for allowing flush medium to flow from the separating tank when it reaches the level of the flush medium outlet means thereby controlling the volume of the flush medium retained in the separating tank,

a first waste receiving tank connected to the lower waste containing section of the separating tank for allowing waste to flow therefrom into the first waste receiving tank,

waste outlet means positioned in the first waste receiving tank for allowing waste to flow from the first waste receiving tank when the waste reaches the level of the waste outlet means thereby controlling the volume of the waste retained in the first waste receiving tank and in the separating tank,

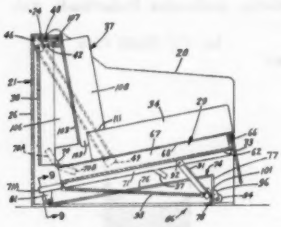
whereby the retained volumes are held substantially constant in both tanks due to the two outlet means and whereby the interface in the separating tank remains at a substantially constant level below the flush medium outlet means thereof even with the periodic receipt of additional flush medium and sewage waste by the separating tank.

3,974,529

BED AND LOUNGE UNIT

Clarence R. Johnson, St. Paul; Jay T. Kidder, Minneapolis, and Orlando N. Talarico, Duluth, all of Minn., assignors to The Tilt-A-Bed Corporation, Minneapolis, Minn.

Division of Ser. No. 479,222, June 14, 1974, Pat. No. 3,925,834. This application Oct. 3, 1975, Ser. No. 619,219
Int. Cl.[2] A47C 17/14
U.S. Cl. 5—18 R 17 Claims



1. A combination bed and lounge unit comprising: a frame, a seat and bed unit having an inner section and an outer section, track means extending rearwardly upward mounted on the frame for guiding the seat and bed unit for selected movement between a bed position and a seat position, means on the inner section engageable with the track means, rail means inclined rearwardly downward secured to the frame located below the seat and bed unit for supporting a part of the seat and bed unit, means mounted on the seat and bed unit engageable with the rail means for movement upwardly on the rail means when the means on the inner section of the seat and bed unit moves downwardly on the track means whereby when a part of the seat and bed unit moves relative to the rail means, a part of the seat and bed unit moves on the track means to facilitate movement of the unit between the seat and bed positions, means for releasably locking the seat and bed unit in the seat position, and means pivotally connected to the outer section permitting movement of the outer section to proper orientation and supporting the outer section in the bed position, said means pivotally connected to the outer section including wheel means for supporting the outer section, support means for carrying the wheel means, means pivotally mounting the support means to the seat and bed unit, stop means on the seat and bed unit to limit movement of the support means relative to the unit, means biasing the support means into engagement with the stop means, said means for releasably locking the seat and bed unit in the seat position comprising a first means on the frame, and second means on the support means cooperating with the first means to hold the support means in a fixed position.

3,974,530

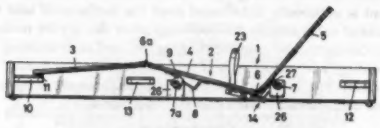
ADJUSTABLE BED

Peter Lusch, and Franz Horenkamp, both of Bielefeld, Germany, assignors to Ferdinant Lusch KG, Bielefeld, Germany

Filed Apr. 25, 1975, Ser. No. 571,618
Claims priority, application Germany, May 11, 1974, 7416494[U]; Nov. 8, 1974, 7437241[U]; Feb. 22, 1975, 7505569[U]
Int. Cl.[2] A61G 7/06; A41C 19/00
U.S. Cl. 5—66 15 Claims

1. An adjustable bed, comprising support means; an elongated frame comprising a head section, a foot section and a center section; first and second hinge means connecting said center section with said head section and said foot section, respectively; first pivot means mounting said head section in the region of said first hinge means on said support means tiltable about a first axis extending transversely of the elongation of said frame; second pivot means on said support means

and defining below said center section a second axis parallel to said first axis; mounting means for permitting movement of the center section in direction of the elongation of the frame and about said second axis, including tiltable elements pivotably mounted on said second pivot means and formed with guide passages extending normal to said second axis, and



elongated guide members fixedly mounted on a lower side of said center section and each slidably extending lengthwise of said frame and through one of said guide passages; and disengageable arresting means on said center and head sections for normally blocking all of said sections against movement relative to one another and to said support means.

3,974,531
FITTED PILLOW CASE

Verona L. Van Pelt, Belmont Acres, Rte. 2, Lancaster, Va. 22503

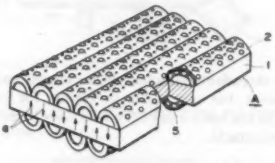
Filed Aug. 4, 1975, Ser. No. 601,339
Int. Cl.² A47G 9/00
U.S. Cl. 5—339 **7 Claims**

1. A fitted pillow case for an unapertured pillow comprising:
a front panel,
a center panel,
a rear panel, each panel being substantially rectangular and approximately identical in dimension and size, each panel has a top and bottom edge and a right and left side edge;
the respective right and left side edges of the panels being joined by sewing along these side edges to define raw seams,
the top edge of the front and center panels being joined whereby a first pocket is defined between the front and center panels,
the bottom edge of the center and rear panels being joined whereby a second pocket is defined between the center and rear panels,
the respective bottom edges of the front and center panels being free of attachment to one another whereby a first opening is defined by these unattached edges into the first pocket,
the respective top edges of the center and rear panels being free of attachment to one another whereby a second opening is defined by these unattached edges into the second pocket, the raw seams being disposed in one of the pockets,
whereby a pillow is adapted to be inserted into the second pocket and the front panel is adapted to be everted over the rear panel to encase the pillow in the second pocket with no portion of the pillow exposed and the encased pillow being unable to unintentionally slip out of the pillow case, the pillow case being made from only the front, center and rear panels with one complete panel covering one side of the pillow and two complete panels covering the other side of the pillow with no edge of any of the panels extending across either side of the pillow, the front and rear panel defining a third and only opening to the ambient through which access may be had to the interior of the pillow case and the pillow encased therein.

3,974,532
PADDING FOR MATTRESSES AND LIKE ARTICLES

Masao Ecchuya, Inagi, Japan, assignor to Mitsuyoshi Hamasu, Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 556,942
Int. Cl.² A47C 27/08
U.S. Cl. 5—345 R **8 Claims**



1. Padding for mattresses and like articles comprising a soft board-like base member and a plurality of elongated padding members disposed in parallel relationship to each other on opposite sides of said base member, each of said elongated padding members having a substantially semi-cylindrical cross-section with its curved surface directed away from said base member and defining an air circulating space between adjacent elongated padding members, and a number of small projections provided on the upper curved surfaces of said elongated padding members, each of said small projections being sufficiently spaced apart from each adjacent projection to give moderate stimulus to the human body.

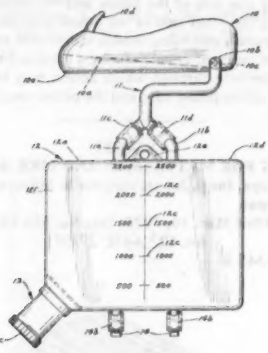
3,974,533
DISPOSABLE ENEMA EVACUANT COLLECTION SYSTEM

James D. Klecker, 1879 Fairmount Ave., St. Paul, Minn. 55105

Filed Oct. 3, 1974, Ser. No. 511,783
Int. Cl.² A47K 11/06
U.S. Cl. 4—112 **1 Claim**

1. A disposable enema evacuant collection system comprising a bedpan having
a large discharge opening, and
an interior bottom surface sloping toward said opening
a flexible plastic receptacle and,
a conduit extending between the discharge opening and the receptacle
valve means for controlling the flow through said conduit,
a discharge opening in the bottom of said receptacle for dumping the evacuant from said receptacle,
said receptacle having a plurality of compartments therein, said conduit having a plurality of branches respectively delivering to said compartments, said valve means including means for selectively controlling flows into the desired branch to control the compartment into which the evacuant is discharged, and each compartment having a separate discharge opening in the bottom thereof, and
a separate specimen-collecting rigid container removably attached to the bottom of one of said compartments and closed at one end and open at the other end, a threaded

exterior portion on both ends of said container, and a cooperatively threaded interior portion formed at the discharge opening of said compartment for removably attaching said container thereto and a closure cap normally threadably attached at the closed end of said rigid container, but removable therefrom for closure attachment to the open end of the container after removal from the receptacle.



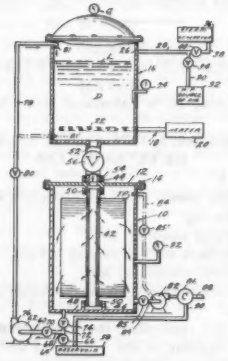
3,974,534
PROCESS FOR VACUUM TREATMENT OF TEXTILE MATERIALS

Emerson McBrayer Yelton, Jamestown, and James Paul Reid, Jr., Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 324,673, Jan. 18, 1973, abandoned, which is a continuation of Ser. No. 109,540, Jan. 25, 1971, abandoned. This application Mar. 21, 1975, Ser. No. 560,883

Int. Cl.[2] D06B 5/18

U.S. Cl. 8—155.1 **28 Claims**



1. In a process for the batch treatment of textile material in the raw, unscoured state with a liquid treating agent, the improvement comprising: placing the textile material to be treated in an enclosed first zone and applying a substantial vacuum to the first zone to produce a greatly reduced subatmospheric pressure therein; providing the fluid treating agent in a second zone and placing the treating agent in said second zone under a positive pressure at least as great as atmospheric pressure; placing the first zone in communication with the second zone through a relatively large diameter conduit; and effecting a very rapid transfer of said treating agent from said second zone through said conduit and into said first zone wherein said treating agent flows through said textile material, said transfer taking place at a flow rate of at least about 500 gallons of said treating agent per minute so that said treating agent is uniformly distributed over the surfaces of said textile material substantially immediately after the textile material is first contacted by said treating agent; and said treating agent including a dyestuff mixed with an alkaline scouring agent whereby the textile material is simultaneously scoured and dyed when treated with said treating agent.

3,974,535
BOAT HULL WITH SPHERICAL DOME

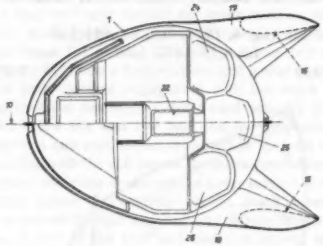
Aldo Guanzini, Boulens, Switzerland, assignor to Nauterra S.A., Lausanne, Switzerland

Filed Dec. 17, 1974, Ser. No. 533,634

Claims priority, application Switzerland, Dec. 18, 1973, 17710/73

Int. Cl.[2] B63B 1/06, 39/06

U.S. Cl. 9—1.3 **6 Claims**



1. A boat comprising a hull the general shape of which is a spherical dome which in the fore part of the boat extends to above the water-line at maximum load while at the sides the part of said hull above the water-line departs from a spherical shape and progressively approaches a cylindrical shape; at least one float-forming lee-board disposed at the aft of the boat and rigidly connected to said hull, said lee-board constituting means for increasing stability of the boat against rolling and pitching, and for dynamically defining a median longitudinal plane of the boat; and a single propeller orientable about a vertical axis comprised in the median longitudinal plane, said propeller constituting means for compelling the boat to turn on itself, when the orientation of said propeller is altered, and for maintaining the median longitudinal plane in the direction of the displacement of the boat, due to the reaction produced by said lee-board.

3,974,536
LIFESAVING DEVICE

Robert S. Franklin, 12 Blakely Circle, Randolph, Mass. 02368

Filed May 27, 1975, Ser. No. 580,743

Int. Cl.[2] B63C 9/00

U.S. Cl. 9—14 **12 Claims**

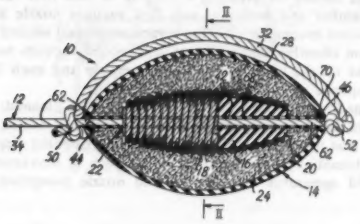
1. A lifesaving device including a waterfloatable elongated body comprising

an elongated shaped core of resilient material, there being a length of a synthetic thermoplastic material rope wound in an encircling course about said core,

a mass of a buoyant material having a specific gravity of less than 1.0 disposed around and completely encasing said core and the windings thereon,

a shell of a resilient material enclosing said mass of buoyant material in contiguous and closely covering conformity

therewith, said core being disposed longitudinally axially within said shell, said body having a central passage extending completely through said mass of material and said core between a pair of openings disposed at oppositely disposed locations in said shell, and



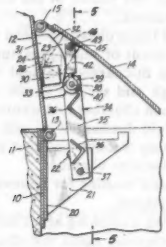
an elongated lifeline securely connected with said body, said lifeline having a terminal length portion extending through said passage.

3,974,537

LIP EXTENDER FOR LOADING DOCK LEVELERS

Lawrence D. Ellis, and Robert E. Evans, both of South El Monte, Calif., assignors to Ellis Industries, Inc., South El Monte, Calif.

Filed May 15, 1975, Ser. No. 577,754
Int. Cl.[2] B65G *11/00*
U.S. Cl. 14—71.3 6 Claims



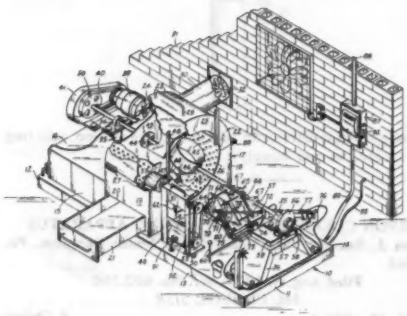
1. A lip extender for use with a loading dock leveler of the type having a vertically directed base plate, a bridge plate pivotally connected to said base plate and a lip pivotally mounted along its inner edge to the outer edge of the bridge plate, said lip extender comprising a lower link pivotally connected at its lower end to said base plate, a toggle arm pivotally connected at its upper end beneath said lip, the opposite ends of said lower link and toggle arm being constructed and arranged so that upon lifting of said bridge plate, the pivotally connected ends of said lower link and toggle arm move into an over-center locking engagement with each other to hold said bridge plate and lip in an elevated position, and a cam mounted beneath said bridge plate, said cam having a cam surface, a cam follower carried by the pivotal connection between said toggle arm and said lower link, said cam follower being adapted to pivot the outer edge of said lip simultaneously upwardly and outwardly as said cam follower is moved upwardly with respect to said cam surface by downward movement of said bridge plate toward a horizontal position, thereby moving the outer edge of said lip over the rear edge of a truck disposed adjacent to the dock leveler without direct lifting movement of the outer edge of said lip.

3,974,538

TURQUOISE SCRUBBER

Kenneth G. Nylund, Rte. 1, Box 40C, Globe, Ariz. 85501

Filed Sept. 2, 1975, Ser. No. 609,389
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—21 D 10 Claims



1. In a turquoise scrubber for removing gel from the surfaces of turquoise rocks:

a. a base,
b. a casing upstanding from said base and having a closed end and an open face,
c. a pair of shaft supports upstanding from said base at opposite ends of said casing,
d. a shaft rotatably mounted on said supports and passing through said casing substantially centrally thereof,
e. a cylindrical screen driveably mounted on said shaft, disposed within said casing and spaced from the corresponding walls of said casing,
f. power means for rotating said shaft,
g. a loading chute mounted on said casing at the open face thereof,
h. a brush pivotally mounted on said base and extending through said open face of the casing into said screen,
i. power means for rotating said brush,
j. a frame pivotally mounted on said shaft in a position spaced from said open face,
k. mechanism for swinging said frame through a limited arcuate movement in reverse directions,
l. a discharge scoop carried by said frame, located within said screen, moveable in said screen in said arcuate movement, and having a leading edge adapted to engage said screen and a spout projected through said open face,
m. mechanism on said frame for raising and lowering said discharge scoop relative to said screen to bring the leading edge thereof into and out of engagement with said screen, and
n. an exhaust conduit communicating with said closed end of said casing.

3,974,539

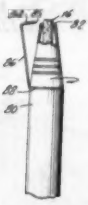
CUTTER DEVICE FOR TYPEWRITER CORRECTION PICK-OFF DEVICE

Victor Barouh, 935 Plum Tree Road West, Westbury, N.Y. 11590, and Robert Glenn, 400 E. 56 St., New York, N.Y. 10022

Filed Jan. 8, 1975, Ser. No. 539,336
Int. Cl.[2] B41J *29/26;* B43L *19/00*
U.S. Cl. 15—104 R 5 Claims

1. A correction device for typewritten material comprising a casing, a barrel rotatable in said casing, a tack wax pick-off rod mounted in said barrel for advancement and retraction relative thereto, and a cutting blade mounted on said barrel

and extending normal to said rod for cutting a flat end on said rod, said cutting blade being integral with a leaf spring section



and a ring being integral with said leaf spring section, said ring being secured to said barrel.

3,974,540

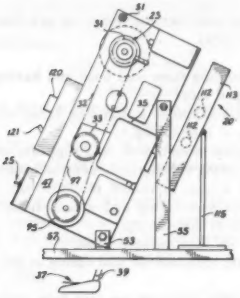
RIBBON CLEANING AND SCANNING APPARATUS

William J. Bonner, 1416 Nancy Drive, South Hampton, Pa. 19066

Filed Aug. 6, 1975, Ser. No. 602,160

Int. Cl.² A47L *5/38*

U.S. Cl. 15—306 A **5 Claims**



5. A cleaning and scanning apparatus for cleaning and scanning ribbons having one end attached to a supply core and an opposite end connected to a take up core, said apparatus comprising: a frame means, a supply chuck means supported by said frame means for mounting the supply core for rotation about a first axis, a take up chuck means mounted on said frame means and spaced from said supply chuck means for receiving and supporting the take up core, a vacuum means extending across the ribbon for applying suction to the ribbon to clean the ribbon of foreign material thereon, a light source located behind the ribbon for allowing the operator to view the ribbon and to spot a hole, tears or defects in the ribbon, a motor drive means for driving the take up chuck means in a forward direction and for driving the ribbon in a forward direction and for selectively driving a supply chuck means in the opposite direction to reverse the direction of the ribbon travel, and magnetic means for attracting magnetizable metal from the ribbon to remove the same during the cleaning operation by magnetic attraction.

3,974,541

APPARATUS FOR CLEANING A FLOOR COVER

Donahue B. Silvis, 304 Lake View, and Edward A. Vargas, 3921 Duke Road, both of Lake Orion, Mich. 48053

Filed Nov. 1, 1973, Ser. No. 411,636

Int. Cl.² A47L *13/26*

U.S. Cl. 15—320 **9 Claims**

1. An apparatus to be moved along a floor for cleaning a floor covering, comprising:

a housing;

a first and a second vacuum chamber disposed within said housing;

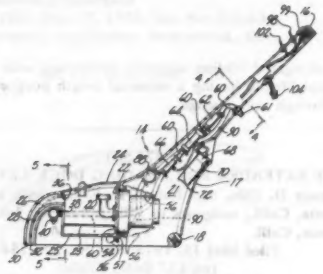
a first vacuum nozzle connected with said first vacuum chamber and a second vacuum nozzle connected with said second vacuum chamber;

a first means for creating a vacuum in said first vacuum chamber and hence at said first vacuum nozzle and a second means for creating a vacuum in said second vacuum chamber and hence at said second vacuum nozzle, said means being individually operable and each being disposed within said housing;

means for spraying a fluid on the floor to be cleaned;

means for delivering the fluid to said spraying means;

said first nozzle comprising an elongated opening disposed substantially perpendicular to the path of movement of said apparatus and said second nozzle comprising an



elongated opening disposed parallel to said first nozzle and ahead of said first nozzle in the direction of movement of said apparatus;

said spraying means being disposed ahead of said nozzles in the path of movement of said apparatus whereby a portion of said fluid discharged on said floor covering is picked up through said second nozzle and deposited in said second vacuum chamber and whereby the remaining portion of said fluid discharged on said floor covering is thereafter picked up through said first nozzle and deposited in said first vacuum chamber;

means disposed in said housing for removing the fluid from said vacuum chambers;

means for introducing a cleaning agent into said fluid delivery means, said cleaning agent introducing means being disposed within said housing; and

valve means to regulate the flow of fluid in said fluid delivery means.

3,974,542

LOCKING DEVICE FOR A CASTORWHEEL FORK

Hendrikus J. M. Timmer, Tiel, and Johannes C. J. Lazaroms, Veenendaal, both of Netherlands, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Apr. 16, 1975, Ser. No. 568,717

Claims priority, application Netherlands, Apr. 22, 1974, 7405398

Int. Cl.² B60B *33/02*

U.S. Cl. 16—35 R **12 Claims**

1. In a steerable castor, having a mounting element, a swivel fork, a roller bearing pivotally mounting said swivel fork to said mounting element, and locking means including a control lever for inhibiting relative rotation of said swivel fork with respect to said mounting element; the improvement wherein said mounting element comprises a substantially flat box-shaped housing, said locking means comprising a substantially flat locking plate slidably mounted in said housing for movement in a plane perpendicular to the pivotal axis of said swivel

fork, and means in the plane of said locking plate fixedly mounted with respect to said swivel fork and positioned to lockingly engage said locking plate at a first position of said

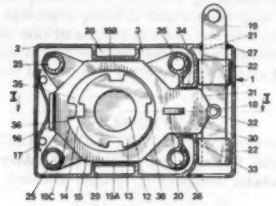


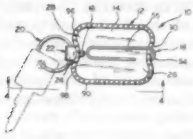
plate in said plane, said control lever being mounted for movement in the plane of said plate to displace said plate between said first position and a second position at which said fork is free to rotate.

3,974,543

COMBINATION KEY RING AND NOTE HOLDER DEVICE

Walter N. Thomas, 8634 S. Indiana, Chicago, Ill. 60619

Filed Sept. 18, 1975, Ser. No. 614,364
Int. Cl.[2] B42F *1/02*
U.S. Cl. 24—67.11 8 Claims



1. A combination key ring and note holder device comprising:

a clipboard comprising a planar body of multi-lateral configuration formed to have its margin define a pair of oppositely extending ends and a pair of oppositely directed side edges extending between same,

said body ends being indented inwardly of the body in the plane thereof adjacent the median portion of the respective body ends,

said body at one of said ends having a stud secured thereto extending normally thereof and disposed adjacent the indentation thereof;

and a clip therefor comprising:

a clip member having a first leg on one side of said body and pivoted on said stud, a second leg on the other side of said body and free of pivotal engagement with said stud, and a bight portion joining said legs,

said legs being formed to resiliently grip said body when said body is disposed therebetween,

said first leg between said stud and said bight portion being proportioned lengthwise thereof to, when said body is disposed between said clip member legs, lodge said bight portion in the indentation of said body other end for frictional swinging movement to either side thereof to dispose said clip member to one side of said board,

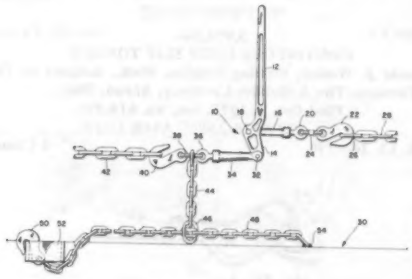
and a key ring anchored to said stud and disposed in interfitting relation with said body one end indentation.

3,974,544

LOAD BINDER SECURITY SYSTEM

Alfred M. Roberts, York, Pa., assignor to Campbell Chain Company, York, Pa.

Filed Sept. 8, 1975, Ser. No. 611,398
Int. Cl.[2] B60P *7/00*; B66F *1/00*; B66D *1/00*
U.S. Cl. 24—68 CT 5 Claims



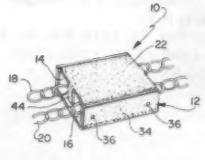
1. A load binder security system, comprising a length of security chain adapted to have one end thereof normally permanently attached to the load binder and to extend freely therefrom, a separate length of binder chain of smaller size than the free end member of said security chain, so that the binder chain can pass freely through said end member of the security chain for adjustment of the latter along the length of the former, and stop means connected to at least one end of the binder chain and dimensioned relative to said end member of the security chain to preclude removal of said end member over said stop means at such end of the binder chain, and means for normal permanent fastening of the other end of the binder chain to the structure in which the binder is used to block removal of the security chain at the other end of the binder chain as well, whereby the load binder cannot normally be removed from its use installation to deter theft of the same.

3,974,545

SLIDE LOCKING ASSEMBLY

Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.

Filed Oct. 6, 1975, Ser. No. 620,014
Int. Cl.[2] F16G *15/00*; A44C *5/02*
U.S. Cl. 24—116 R 10 Claims



1. In a chain assembly including chain members for necklace constructions and the like, a slide locking assembly through which said chain members extend, said slide assembly comprising a housing having inner and outer case sections, said inner case having a bottom wall, upstanding side walls connected thereto and a centrally positioned integral tab upstanding from each end thereof, said side walls and said tabs defining longitudinally orientated channels along said inner case for receiving and maintaining separation between said chain members, said outer case having a generally planar top and side walls downwardly extending therefrom, said inner case side walls having a plurality of inwardly extending depres-

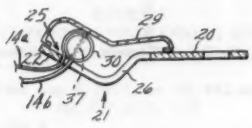
sions therein, said outer case side walls having a plurality of inwardly extending projections thereon, said projections adapted for snap-fit engagement within said depressions when said inner and outer case sections are assembled, and spring means supported by said inner case bottom wall for urging said chain members into frictional contact with said outer case top wall, whereby varied relative positions between said chain members and said slide locking assembly may be maintained.

3,974,546

CONTINUOUS LOOP SLIP TONGUE

Ronald J. Walker, Sterling Heights, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 2, 1975, Ser. No. 618,891
Int. Cl.² A62B 35/00; A44B 11/10
U.S. Cl. 24—196 4 Claims



1. A slip tongue plate assembly for seat belts and the like comprising:

a tongue plate having an integral channel housing extending therefrom, said channel housing having a raised transversely bent bottom portion and spaced-apart side walls, said bottom portion having a seat belt webbing aperture therethrough, said aperture defined at one end by a transverse lock buttress edge and support track flanges extending from said side walls;

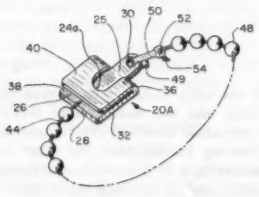
a round bar freely mounted within said channel housing on said support track flanges so as to transversely extend across said seat belt webbing aperture, said round bar provided with an elongate seat belt webbing receiving slot having seat belt webbing freely positioned therethrough, said round bar being freely slidable and rotatable on said support track flanges within said housing along said aperture while permitting free movement of the seat belt webbing through said slot, said round bar being rotatable and lockable upon said lock buttress edge so as to lock said webbing against movement when said webbing is stressed to reverse upon itself.

3,974,547

JEWELRY CLASP MEMBER

Paul V. Little, Massapequa, N.Y., assignor to Dover Findings, Inc., Deer Park, N.Y.

Filed Nov. 11, 1975, Ser. No. 630,908
Int. Cl.² A44B 17/00; F16G 15/00; A44B 13/00
U.S. Cl. 24—201 BN 9 Claims



1. A one-piece jewelry clasp member adapted for securement to a cord of a necklace or the like comprising

a U-shaped body, having two opposing generally rectangular flat sides;

a curved bight integral with said sides at the apex of said body;

a tab extending outwardly of said bight coplanar with one side of said body for detachable engagement with another clasp member; and

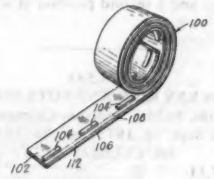
a bowed rib extending inwardly of said body integral with said one side thereof and defining a passage with said other side, whereby one end portion of said cord can be passed through said passage and secured in said body by flattening said rib at said other side of said body.

3,974,548

EASILY DISMANTLED PARTITION STRUCTURE

Samuel P. Meiel, Roxboro, and Cameron W. Sherry, Dorion, both of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Dec. 16, 1974, Ser. No. 526,903
Claims priority, application Canada, June 6, 1972, 145756
Int. Cl.² A44B 17/00, 11/00
U.S. Cl. 24—204 6 Claims



1. A fastener strip for securing panels to studs which have been provided with fastener elements, said fastener strip comprising a backing strip, cooperating fastener element means secured to one face of said backing strip, said cooperating fastener element means being spaced from the side edges of said backing strip and having one edge thereof substantially parallel to the longitudinal axis of said backing strip and located more closely adjacent to one side edge of said backing strip, a fold line extending substantially parallel to the longitudinal axis of said backing strip and along said one side edge of said cooperating fastener element means, said fold line facilitating folding said strip over an edge of a panel, a layer of adhesive positioned substantially over the entire surface of the opposite face of said strip for securing said strip to said panel one of said fastener elements and said cooperating fastener element being in the form of a plurality of loops and the other of said fastening elements and said cooperating fastening element means being a plurality of hooks to cooperate with such loops.

3,974,549

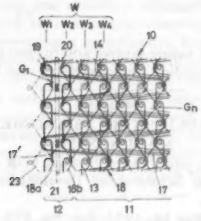
WARP-KNITTED TAPE FOR SLIDE FASTENER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 26, 1974, Ser. No. 527,223
Claims priority, application Japan, Nov. 30, 1973, 48-138596[U]
Int. Cl.² A44B 19/00
U.S. Cl. 24—205.1 C 5 Claims

1. In a slide fastener having a warp-knitted tape, a row of fastener elements stitched to said tape along a marginal edge portion thereof, and a slider moveable along said fastener elements in sliding contact with a predetermined width portion of the tape, the improvement which comprises the tape having a web portion and a marginal edge portion extending longitudinally of the tape, said web portion including chain stitches that form wales, tricot stitches interknitted therewith and extending across at least two adjacent wales, and transverse lapping threads each laid over and across a plurality of wales and arranged to wrap around a location where said

chain stitches and said tricot stitches are interknitted in each course, and said marginal edge portion including chain stitches that form a first wale and a group of adjacent wales, including a second wale and transverse lapping threads each laid over and across said first wale and adjacent wales, said first wale and second wale being in direct adjacency and spaced apart without any tricot stitch spanning therebetween to provide an interwale groove greater in width than each of



the other wales in the web portion whereby said group of adjacent wales are held together to provide therebetween interwale grooves narrower than the remaining grooves in the web portion, said group of adjacent wales being disposed for sliding contact with the slider and defining said predetermined width portion of the tape, said fastener elements being stitched to the tape by stitches received in said greater width wale groove between said first and second wales.

3,974,550

SLIDE FASTENER STRINGER

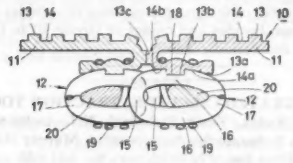
Yoshinori Fujisaki, Kurobe; Yoshio Matsuda, Nyuzen, and Yoshitoki Tsubokawa, Kurobe, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 10, 1975, Ser. No. 612,108

Claims priority, application Japan, Sept. 25, 1974, 49-116205[U]

Int. Cl.² A44B *19/12*

U.S. Cl. 24—205.1 C **3 Claims**



1. In a slide fastener stringer comprising a warp-knitted tape having longitudinally extending alternate wales and interwale grooves and a row of interlocking fastener elements each having an interlocking head and two legs and mounted on and along one longitudinal edge portion of said tape, the improvement wherein an anchoring wale neighbouring an innermost wale of the tape is greater in height and width than said innermost wale and is adapted for fitting engagement with a recess formed in one of the two legs of each element, and supporting interwale grooves located on opposite sides of said anchoring wale are greater in width than the remaining interwale grooves of the tape and are adapted for the passage of sewing threads therethrough, whereby the knit fabric of the tape including that of said anchoring wale, said innermost wale and said supporting interwale grooves is brought into pressure engagement intimately with said one leg of each element by the sewing threads into position on the tape.

3,974,551

THREAD CLAMP FOR WARP END TYING-IN MACHINES

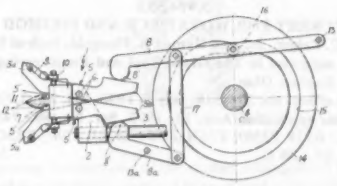
Hans Baer, and Kurt Reichert, both of Augsburg, Germany, assignors to Knotex Maschinenbau GmbH, Augsburg, Germany

Filed Oct. 28, 1975, Ser. No. 625,867

Claims priority, application Germany, Oct. 29, 1974, 2451258

Int. Cl.² D03J *1/18*

U.S. Cl. 28—49 **5 Claims**



1. In a thread clamp for warp end tying-in machines, comprising two clamping jaws, which are pivotal about pivot axes which are arranged parallel to one another, an abutment bar which is arranged between the clamping jaws and a spring for each clamping jaw, said spring pressing the clamping jaw against the abutment bar with an adjustable spring force and a control shaft for controlling the remaining parts of the warp end tying-in machine, the improvement comprising wherein for each clamping jaw there is provided an operating member which cooperates with said clamping jaw and which is controlled by the control shaft, said operating member lifting the clamping jaw off from the abutment bar at a selected point in the operating cycle.

3,974,552

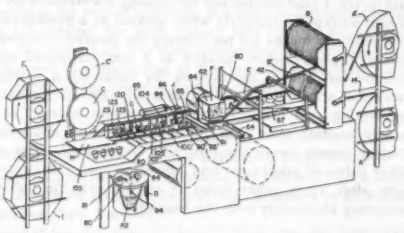
APPARATUS FOR CONSTRUCTING THREE-DIMENSIONAL SIGN CHARACTER

Robert W. Minogue, Cupertino, and Lloyd E. Troyer, San Carlos, both of Calif., assignors to LET-R-EDGE Of Canada Ltd., Alberta, Canada

Division of Ser. No. 379,012, July 13, 1973, Pat. No. 3,937,384, which is a continuation-in-part of Ser. No. 356,983, May 3, 1973, abandoned. This application Sept. 12, 1975, Ser. No. 612,897

Int. Cl.² B23P *23/00*

U.S. Cl. 29—33 S **2 Claims**



1. An apparatus for producing circumscribing sheet metal siding for plastic sign characters comprising: means for dispensing at a continuous rate a strip of sheet metal material having two parallel spaced apart side edges to a working station; a grinder at said working station overlying one edge of said continuously passing sheet metal strip for abrading a band adjacent one of said edges of said sheet metal strip as said strip passes said working station; means for applying plastic-to-metal adhesive at said working station to said continuously passing sheet metal strip on said abraded band; means for

continuously dispensing to said working station a plastic strip; means for continuously compressing said plastic strip onto said sheet metal band at said abraded glued layer at a preselected point at said working station; means for curing said adhesive to bond said plastic strip to said abraded band on said sheet metal strip; takeup means for said complete sheet metal strip at the downstream end of said working station; and including opposed rollers for convoluting both edges of said sheet metal strip.

3,974,553

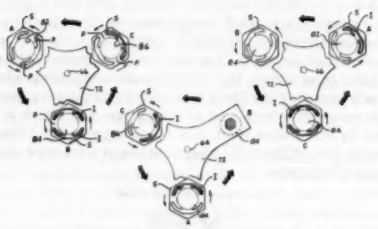
TURRET FOR WORKPIECE AND METHOD

Arthur C. Reiger, Jr., and Hyman B. Finegold, both of Dayton, Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Division of Ser. No. 376,518, July 5, 1973, Pat. No. 3,926,421. This application Aug. 11, 1975, Ser. No. 603,745

Int. Cl.² B23P *23/00*; **F16H** *27/04*; **B24B** *5/00*; **B23C** *3/28*

U.S. Cl. 29—38 C **1 Claim**



1. A machine for performing operations on workpieces wherein two essentially identical operations are performed on each workpiece, a turret having an odd number of workpiece supports, means for repeatedly indexing said turret about a predetermined axis through an angle equal to 360° divided by the number of workpiece supports, means for rotating said workpiece supports relative to said turret during each index of said turret, a load mechanism for loading a workpiece on each of said workpiece supports when located at a predetermined first position, means for performing the desired operation on said workpieces when located at a predetermined second position, an unload mechanism for receiving a workpiece located at a third position, harmonically operating means for performing said operations on workpieces located at said second position after each index of said turret, and machine control means operating said load mechanism after every other index of said turret and operating said unload mechanism after every other index of said turret, the unloading occurring alternately with the loading.

3,974,554

QUADRANGULAR TRIHELICOID GRAVURE ROLL

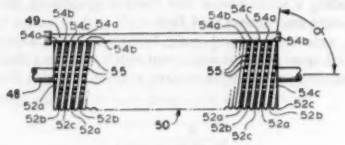
Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 16, 1975, Ser. No. 578,310

Int. Cl.² B21B *27/02*, *31/08*; **B05B** *5/02*

U.S. Cl. 29—121.4 **9 Claims**

1. An article of manufacture adapted for use in the fluid development of electrostatic images characterized by a substantially cylindrical roll having at least one volute groove and one convex, volute land extending parallel to said groove, and means intersecting said groove defining a plurality of cells for carrying a quantity of development fluid, said cells being



located within said volute groove and further defined by concave partitions extending transversely to said land.

3,974,555

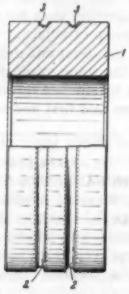
ROLLS FOR ROLLING MILLS AND METHOD FOR MAKING SAME

Gerolf Strohmeier, and Johann Bodem, both of Reutte, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed May 16, 1975, Ser. No. 578,197

Int. Cl.² B21B *31/08*

U.S. Cl. 29—132 **26 Claims**



1. An improved roll for hot rolling at elevated temperatures, said roll comprising a hard coating, said coating comprising at least one member of the group consisting of carbides, carbonitrides, nitrides, borides and oxides of Group III to Group VI elements of the Periodic Table.

3,974,556

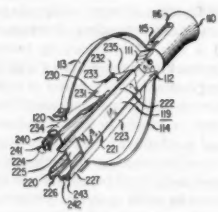
INTEGRATED CIRCUIT EXTRACTION TOOL

Peter Steve Kubik, South Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1975, Ser. No. 641,650

Int. Cl.² H05K *3/34*

U.S. Cl. 29—203 B **8 Claims**



1. A tool for extracting an integrated circuit package from a circuit board, said circuit package having a first and a second plurality of equally spaced-apart pins affixed along parallel sidewalls, said tool including

a handle member,

means, affixed to said handle member, for grasping an underside of said circuit package about at least one pin of each of said first and second plurality of pins,

means for straddling said circuit package perpendicular to said first and second plurality of pins, said straddling means including first and second pairs of parallel, spaced-apart legs,

means for slidably coupling said straddling means to said grasping means, and

first and second oppositely directed bow springs each of which has one end affixed to said handle member and an opposite end affixed to said coupling means, said bow springs converting a compressive force applied thereto into a compressive component and an extensive component, said compressive component actuating said grasping means and said extensive component shifting said straddling means downwardly away from said handle member thereby producing a nearly uniform perpendicular force on each of said parallel pairs of legs to effect the extraction of said circuit package by said grasping means.

3,974,557

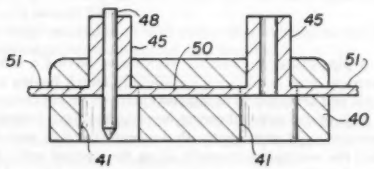
METHOD OF MAKING HARD WALL FASTENER

Rüdiger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Mar. 6, 1975, Ser. No. 555,737

Int. Cl.² B23P 17/00

U.S. Cl. 29—418 **22 Claims**



1. A method for producing an article having a first element releasably held in a second element, comprising forming said first element of a die casting metal with a portion to be releasably held and at least one gate portion joining said portion to be releasably held, and then forming said second element by die casting a die casting metal to substantially bury said gate portion in said second element.

3,974,558

METHOD OF INSTALLING ANNULAR SEAL FOR COAXIAL TUBULAR MEMBER

Werner H. Fengler, and Richard R. Fengler, both of 23651 Fordson Drive, Dearborn, Mich. 48124

Division of Ser. No. 375,737, July 2, 1973, Pat. No. 3,884,483. This application May 1, 1975, Ser. No. 573,475

Int. Cl.² B23P 11/02

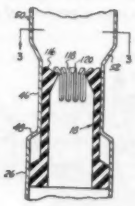
U.S. Cl. 29—451 **1 Claim**

1. A method of installing a resilient tubular elastomeric spool-shaped seal between an inner tubular cylindrical member and a spool-shaped constriction in an outer tubular member spaced radially outward from said inner tubular member, said method comprising

a. forming in and around one of the annular opposite end enlargements of said resilient tubular elastomeric spool-shaped seal a multiplicity of circumferentially-spaced longitudinally-extending radial slots,

b. pushing the thus-slotted end enlargement into the correspondingly-tapered entrance to said constriction while causing said entrance to force the portions of the slotted end enlargement between said slots to yield radially inward,

c. continuing to push the seal into said constriction until the slotted end enlargement passes out of said constriction and the other end enlargement engages as a stop the portion of said outer tubular member immediately preceding the constriction,



d. causing the portions of the slotted enlargement between said slots to spring outward beyond said constriction, and

e. inserting a cylindrical tubular member into said tubular seal.

3,974,559

CONTINUOUS CASTING PROCESS

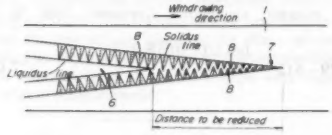
Takaho Kawawa, Tokyo; Tohru Arimura, Yokohama, and Masaru Okado, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1974, Ser. No. 453,276

Claims priority, application Japan, Mar. 26, 1973, 48-33507

Int. Cl.² B22D 11/16

U.S. Cl. 29—527.7 **1 Claim**



1. In a process for manufacturing continuous cast steel, wherein said steel is cast, then cooled and then worked while still in a partially molten state by multiple pairs of withdrawing rolls arranged following said cooling stage; the improvement comprising the step of reducing, at a rate corresponding to less than 1.5 percent for each pair of said rolls at the working stage, the portion of said steel sandwiched between the liquidus line and the solidus line at the front end of a crater which is produced as the liquidus part is solidified.

3,974,560

METHOD OF MAKING A BIPOLAR TRANSISTOR

Charles William Mueller, Princeton, and Edward Curtis Douglas, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 466,287, May 2, 1974, Pat. No. 3,943,555. This application Sept. 29, 1975, Ser. No. 617,717

Int. Cl.² B01J 17/00

U.S. Cl. 29—590 **11 Claims**

1. A method of making a bipolar transistor in a layer of single-crystal silicon deposited on an insulating substrate comprising the steps of:

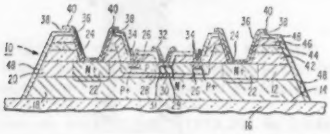
a. ion implanting a collector contact well of one type conductivity impurity through a first portion of said layer,

b. annealing said layer for about 15 minutes at between about 900° and 1100°C in a non-oxidizing ambient, to diffuse said collector contact well into said layer,

c. ion implanting a base contact well of an opposite type conductivity impurity through a second portion of said layer, adjacent to said first portion,

d. ion implanting a base region of said opposite type conductivity impurity through a third portion of said layer and in contact with said base contact well,

e. ion implanting an emitter region of said one type conductivity impurities into a portion of said base region,



f. capping said portion of said base region and said emitter region with a layer of insulating material prior to subsequently annealing said layer,

g. annealing said layer for about 10 minutes at between about 700° and 900°C in a non-oxidizing ambient,

h. applying separate metal contacts to said collector contact well, said base contact well, and said emitter region, respectively, and

i. annealing said layer at between about 300° and 450°C in hydrogen for about 15 minutes.

3,974,561

METHOD OF PRODUCING DIRECTLY HEATABLE HOLLOW SEMICONDUCTOR BODIES

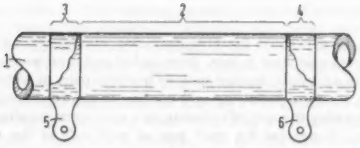
Manfred Schnöeller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 30, 1974, Ser. No. 474,660

Claims priority, application Germany, Aug. 8, 1973, 2340225

Int. Cl.² H05B *3/00*

U.S. Cl. 29—611 **7 Claims**



1. A method of producing a directly heatable hollow diffusion body composed of a semiconductor material comprising:

forming a hollow body about a heated carrier member by a gas phase deposition process;

removing the so-formed hollow body from the carrier member;

coating select spaced-apart surface zones of said hollow body with a dopant-containing lacquer which includes sufficient dopant to provide a concentration greater than 10^{20} atoms of dopant per cubic centimeter in the doped zones of the hollow body, said lacquer vaporizing without residue remaining on said zones;

subjecting the so-coated body to diffusion conditions sufficient to diffuse said dopant into the coated zones of said body; and

attaching current terminals to the doped zones of said body whereby current supply to said terminals heats the body directly to select temperatures.

3,974,562

PIPE CUTTING DEVICE

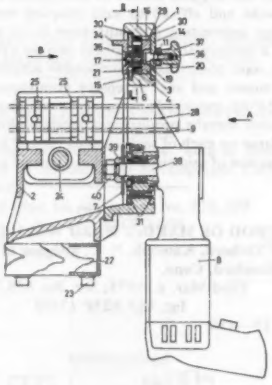
Xaver Wüchner, Jestetten, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 28, 1975, Ser. No. 554,107

Claims priority, application Switzerland, Mar. 7, 1974, 3244/74

Int. Cl.² B23D *21/06*; B26B *27/00*; B26D *3/16*

U.S. Cl. 30—97 **9 Claims**



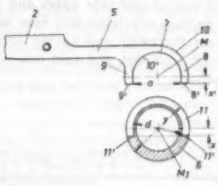
1. A pipe cutter for cutting workpieces having a range of diametrical sizes comprising a stationary chuck having a central axis and arranged to hold a workpiece to be cut concentric with the central axis, a bearing housing having a central axis disposed in axial alignment with the central axis of said chuck so that the workpiece extends along the central axis of said bearing housing, a rotor concentrically mounted in said bearing housing, a cutting support mounted in said rotor for pivotal movement, a motor driven cutting tool supported on said cutting support for movement therewith relative to a workpiece, wherein the improvement comprises a first bore concentrically formed in said bearing housing, said rotor comprises a ring rotatably mounted in said first bore in said bearing housing with its outer circumferential surface concentric to the central axis of said bearing housing, said ring having a second bore therein located eccentrically to the central axis of said bearing housing, said cutting support being pivotally positionable with respect to said ring within the second bore in said ring to thereby move the cutting support eccentrically to the workpiece into position for effecting the cutting operation, and rotatable with said ring within the bearing housing, said cutting support having an opening therethrough extending around the central axis of said bearing housing and the surface forming the opening spaced radially outwardly from the maximum diametrical sized workpiece positionable within said bearing housing, said cutting tool being mounted on said cutting support so that it pivots with said cutting support between a rest position spaced the maximum pivoted distance from the workpiece and a second position in contact with the workpiece to be cut, means for releasably locking said ring to said bearing housing between said rest and second positions of said cutting support, a first stop attached to said ring and defining the rest position of said cutting support relative to said ring, a second stop movably positionably attached to said ring in accordance with the diametrical size of the workpiece to be cut, a driving pin positioned in said cutting support and arranged to contact said second stop when said cutting tool on said cutting support is in position in contact with a workpiece and to rotate said ring concentrically together with said cutting support about the workpiece when said cutting support is rotated within the bearing housing about the workpiece.

3,974,563

SCISSORS, PARTICULARLY HOUSEHOLD- OR TAILOR-SCISSORS

Ulf Koch, Solingen, Germany, assignor to J.A. Henckels Zwillingswerk Aktiengesellschaft, Solingen, Germany

Filed Feb. 17, 1976, Ser. No. 658,732
Claims priority, application Germany, Mar. 20, 1975, 2512188
Int. Cl.² B26B *13/04*
U.S. Cl. 30—341 7 Claims



1. A scissors, particularly a household- or tailor- scissors, including eyes made of synthetic material or the like arranged on handles thereof, comprising

two pivotally connected members having handles, respectively,

said handles are formed with forks, respectively, having prongs defining an outwardly directed fork opening on each of said handles,

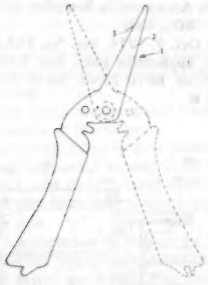
eye rings insertable in said forks, respectively, in said fork openings, respectively, of said handles.

3,974,564

SURFACE HARDENED STEEL CUTTING BLADE

John A. Hough, Auckland, New Zealand, assignor to Tullen Industries Limited, Auckland, New Zealand

Filed Dec. 29, 1972, Ser. No. 319,387
Claims priority, application New Zealand, Nov. 23, 1972, 169095
Int. Cl.² B26B *13/00;* B21K *11/06*
U.S. Cl. 30—350 7 Claims



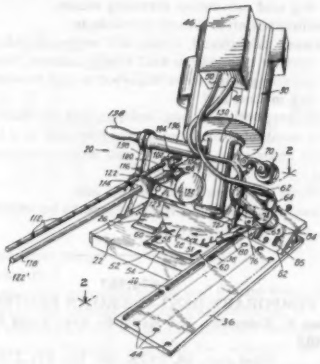
1. A shear type cutting tool comprising a pair of interconnected shearing blades for reciprocation between an open and closed state the latter of which completes a shearing action of the tool, each one of said blades having an inner face and an edge face the intersection of which defines a cutting edge thereof, the inner face being that face of a respective one of said blades lying closest to the other during the closed state of said reciprocating shearing blades and having a hardened surface of from 0.002 to 0.008 inches thick, backed by a softer layer which is exposed at said edge face adjacent the cutting edge of each of said blades.

3,974,565

ADJUSTABLE CUTTING MACHINE

Emily W. Ellis, New York, N.Y., assignor to Simplex Cutting Machine Company, Inc., New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,004
Int. Cl.² B23D *45/16*
U.S. Cl. 30—376 14 Claims



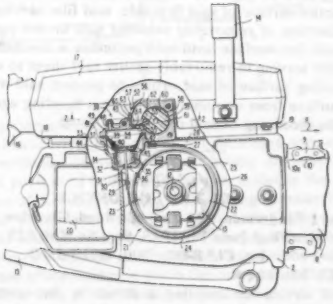
1. A machine for cutting sheet material having a base and a motor assembly mounted thereon adapted to rotate a circular cutting blade about an axis normally parallel to said base comprising: main plate means pivotably supporting said motor and blade assembly to said base, a locking arm element pivotably secured to said pivotably supporting means, and to said base about a common pivot axis with the axis of said pivot of said pivotably supporting means; and means securing said pivotably supporting means in a substantially fixed set position including means for locking said locking arm element in place, whereby the axis of said blade or the plane of said cutting blade may be set at a predetermined angular position so as to cut said sheet material at a desired angle with respect to the plane of said sheet material.

3,974,566

METHOD AND APPARATUS FOR ARRESTING MOVEMENT OF A CHAIN SAW CUTTER CHAIN

Edward J. Pilatowicz, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Sept. 8, 1975, Ser. No. 611,143
Int. Cl.² B27B *17/02*
U.S. Cl. 30—382 10 Claims



6. An apparatus for arresting the movement of the cutter chain of a chain saw, said apparatus comprising:

movement-arresting means operable to arrest the movement of a cutter chain of a chain saw;

chain saw engine-actuated, energy-developing and storing means operable to

develop cutter chain movement-controlling energy during, and in response to, operation of the engine of said chain saw;

store said developed energy for subsequent use in actuating said movement-arresting means,

movement-control means operable to

release said stored, chain saw engine-developed energy and, in response to said energy release, cause motion-arresting force to be imparted to said movement-arresting means; and

inertia-responsive means, independent of chain saw operator manipulation, operable, in response to a kick-back of said chain saw, to actuate said movement-control means to

release said developed energy, and

cause said motion-arresting force to be imparted to said motion-arresting means.

3,974,567

TEMPORARY DENTAL CROWN PROTECTOR

William V. Ridgeway, 265 Redondo Ave., Long Beach, Calif. 90803

Filed Apr. 24, 1975, Ser. No. 571,256

Int. Cl.² A61C *19/00*

U.S. Cl. 32—1 **3 Claims**

1. In combination with a support that has a surface of substantial area, a plurality of dental crown protectors mounted in spaced relationship on said first surface, each of said crown protectors including:

a. A sheet of material of sufficient area and of such shape as to cover the undulating masticating surface of said crown, with said sheet being sufficiently pliable as to conform to the configuration of said surface, and said sheet including a first side; and

b. A film of pressure sensitive adhesive that covers the entire surface of said first side, said film serving the dual function of removably securing said crown protector to said first surface until said protector is needed, and said film serving to removably secure said sheet to said masticating surface of said crown to protect said masticating surface from contamination with a bonding agent during the mounting of said crown on a tooth.

3,974,568

DRIVERS LOG DEVICE

Gilbert I. Linderman, 524 Glendale Road, Glenview, Ill. 60025

Filed June 11, 1975, Ser. No. 586,027

Int. Cl.² B43L *7/00;* **G01B** *3/10*

U.S. Cl. 33—107 R **2 Claims**

1. A device for assisting a driver in the comparison of spaced numbers for computation of hours worked during a specific number of days from a daily record form, comprising:

a. a relatively thin, flat, elongated base member formed of a transparent material and having:

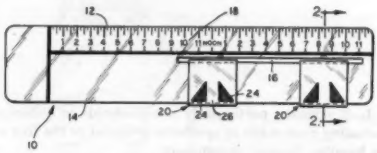
i. a pair of opposed, parallel, smooth, uninterrupted side edges extending substantially the entire length thereof;

ii. a relatively narrow, elongated slot located between and extending parallel to said side edges for a distance which is less than the length of said base member;

b. a pair of indexing members mounted on said base member between said slot and one of said side edges for sliding movement relative to said base member and to each other;

c. each of said indexing members being in the form of a band snugly encompassing the base member between said slot and said one of said side edges and comcomprising:

i. an upper section overlying said base member in facing engagement therewith and having opposed side edges aligned with said slot and said one side edge of said base member;



ii. said upper section having a pair of spaced opaque markings defining a transparent area therebetween;

iii. a pair of rear sections underlying said base member in facing engagement therewith;

iv. a pair of integral, relatively narrow connecting sections extending through said slot and around said one side edge of the base member and interconnecting said front and rear sections;

d. the area of the upper surface of said base member which is located between said slot and said other edge thereof is provided with graduated markings thereon which are spaced for alignment with corresponding markings of a standard United States Department of Transportation Drivers Daily Log time sheet.

3,974,569

AUTOMATIC STATION FOR MEASURING THE SIZES OF MECHANICAL WORKPIECES

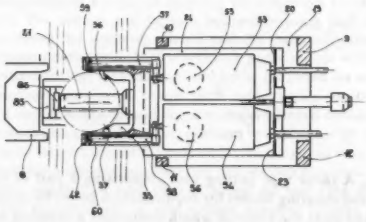
Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplica di Mario Possati & C., Bentivoglio (BO), Italy

Filed Oct. 9, 1974, Ser. No. 513,394

Claims priority, application Italy, Apr. 5, 1974, 3341/74

Int. Cl.² G01B *5/08;* **B07B** *13/04;* **B07C** *5/07;* **G01B** *3/38*

U.S. Cl. 33—143 R **2 Claims**



1. In an automatic measuring device for measuring linear dimensions of workpieces and comprising:

a support for supporting a workpiece in a measurement position when the measurement of said linear dimensions is carried out;

loading and unloading means for loading the workpiece onto and unloading it away from said support;

reference elements arranged at said support for providing a mechanical reference to the workpiece to be measured;

positioning and reference means movable towards and away from said support for contacting the workpiece and positioning it on the support, the positioning and reference means including: a slide movable toward and away from said support; positioning and reference members carried by the slide for contacting the workpiece and positioning it on the support; and a mechanical link coupled between the slide and the positioning and reference members for permitting a relative movement of the positioning and reference members in respect to the slide; and

measuring heads having moving arms carrying feelers adapted to contact the surface of the workpiece for measuring said dimensions, the improvement in which said measuring heads are fixedly but adjustably coupled to said positioning and reference members, the positioning and reference members comprising a protection member embracing said moving arms for protecting them from casual impacts, said protection member being arranged to cooperate with the workpiece to drive it towards the measurement position.

3,974,570

INDICATOR FOR MEASURING APPARATUS

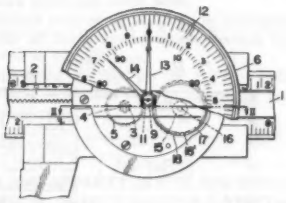
Kenju Uchino, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Aug. 13, 1974, Ser. No. 496,990

Claims priority, application Japan, Aug. 15, 1973, 48-091517

Int. Cl.² G01B *3/20*

U.S. Cl. 33—147 T **1 Claim**



1. A measuring device comprising a rigid elongated member, a slider mounted to slide along said elongated member, an indicator comprising:

a rack extending along the elongated member in the direction of movement of the slider,

two gear trains having different gear ratios, each train comprising a shaft supported by said slider a pinion meshing with said rack and fixed to said shaft, an intermediate gear fixed to said shaft, and a driven gear driven by said intermediate gear;

a first pointer connected to be rotated by one of said driven gears and a second pointer connected to be rotated by the other of said driven gears, said first and second pointers being mounted to rotate about a common axis;

first and second backlash gears rotatably mounted on the shaft to which one of said intermediate gears is fixed, on opposite sides of said one intermediate gear, said first backlash gear meshing with one of said driven gears and said second backlash gear meshing with the other of said driven gears, and

spring means between said first backlash gear and said one intermediate gear and between said second backlash gear and said one intermediate gear, urging said backlash gears in opposite directions relative to said one intermediate gear to eliminate backlash in said gear trains.

3,974,571

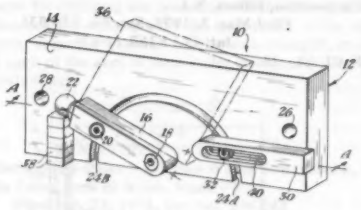
SINE BAR

George W. LaPierre, c/o One Financial Plaza, Suite 2400, Lauderdale Lakes, Fla. 33394

Continuation of Ser. No. 402,283, Oct. 1, 1973, abandoned. This application Mar. 18, 1975, Ser. No. 559,541

Int. Cl.² B23Q *3/04*

U.S. Cl. 33—174 S **5 Claims**



1. A sine bar comprising:

a block housing;

a sine bar pivotally mounted at one end to said block housing adjacent one surface of said block housing;

said block housing having a channel disposed therein;

means connected through said sine bar adjacent the free end thereof and disposed within said block housing channel for rigidly locking said sine bar to a fixed predetermined angle relative to said block housing;

a work piece stopping means; and

a connecting means adjustably connecting said work piece stopping means to said block housing and disposed within said block housing channel for rigidly blocking said stopping means at a fixed position relative to said block housing.

3,974,572

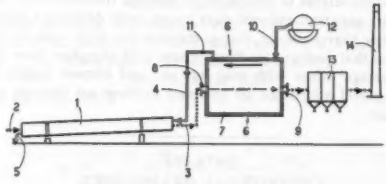
PROCESS AND HEAT EXCHANGER FOR CONTINUOUS CIRCULATION OF FLUIDIZED POWDER IN HEAT EXCHANGE WITH A HOT GAS

Georges Cerles, and Robert Bitsch, both of Gardanne, France, assignors to Aluminium Pechiney, Lyon, France

Filed Jan. 16, 1975, Ser. No. 541,567

Int. Cl.² F26B *3/08*; F27B *15/00*

U.S. Cl. 34—10 **18 Claims**



1. In a process for heat exchange between a fluidized powder and a heat-carrying gas comprising providing one or more pairs of vertically disposed passages having an inlet in the upper end portion of one passage and an outlet in the upper end portion of the other passage with a passage connecting the lower end portions of the pair, introducing the powder through the inlet into one passage, and causing a fluidizing gas to flow upwardly through each of the passages in the pair with the flow rate of the fluidizing gas in the one passage being less than the flow rate of the fluidizing gas in the other passage whereby the fluidized powder in the one passage is higher in density than the powder in the other passage automatically to cause flow of the powder from the inlet downwardly in the one

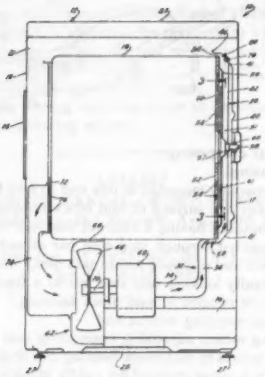
passage, across the communicating passage to the other passage and up the other passage to the outlet, and passing the heat-carrying gas in heat exchange relation with said pair of passages.

3,974,573

DRYER HAVING IMPROVED HEATING SYSTEM

Thomas E. Daily; Charles O. Stanford, both of Herrin, Ill., and William L. Hinners, Connersville, Ind., assignors to Fedders Corporation, Edison, N.J.

Filed Mar. 3, 1975, Ser. No. 554,531
Int. Cl.² F26B 11/02
U.S. Cl. 34—48 9 Claims



1. A gas dryer comprising a cabinet having a rotatable cylinder therein for receiving materials to be dried; a gas burner head for producing hot air to dry the materials, duct means for providing a passage for the flow of said hot air from said gas burner head to said cylinder; said cylinder having a rear wall provided with openings therethrough for the entrance of hot air into said cylinder; said duct means comprising at least a member having a front wall in facing and spaced relationship to said cylinder rear wall and having openings for the passage of hot air therethrough, a peripheral flange on said front wall extending forwardly from said front wall and receiving the end of said cylinder therein so that said peripheral flange circumferentially surrounds said cylinder and is radially spaced therefrom to define an air passage therebetween, said cylinder rear wall and said duct means walls defining a mixing chamber therebetween that communicates with said air passage so that ambient air flowing into said chamber from said air passage mixes with said hot air; and blower means for forcing said mixed hot air and said ambient air through said cylinder.

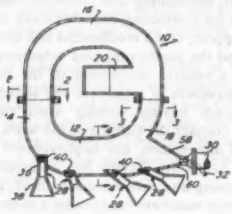
3,974,574

CENTRIFUGAL DRYING MILL

Edward Van Vliet; George W. Fendler, both of Doylestown, and Lynn Himmelberger, Harleysville, all of Pa., assignors to Fluid Energy Processing & Equipment Co., Hatfield, Pa.

Filed Mar. 10, 1975, Ser. No. 556,643
Int. Cl.² F26B 15/00, 17/00
U.S. Cl. 34—57 E 5 Claims

1. A centrifugal drying mill for wet particles comprising an arcuate mill which includes a drying chamber having a feed inlet for particles to be dried and gaseous inlet nozzles, said nozzles being connected to a source of hot gaseous fluid, an upstack connected to one end of said drying chamber, a classification section connected to said upstack, a downstack connected to said classification section, and an exhaust duct extending from the inner periphery of the mill between said classification section and downstack, said downstack being connected to said drying chamber in spaced relation to said feed inlet, said drying chamber having a trapezoidal cross-section including a substantially flat inner peripheral wall and a substantially flat outer peripheral wall, said inner and outer



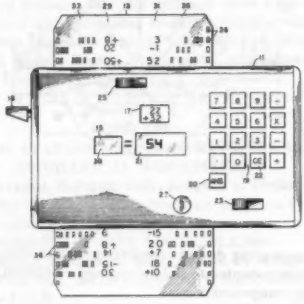
peripheral walls being substantially parallel to each other, said inner peripheral wall being wider than said outer peripheral wall, said nozzles being positioned in said outer peripheral wall, and each of said nozzles having a rectangular nozzle opening that extends across substantially the full width of said outer peripheral wall.

3,974,575

TEACHING MACHINE

Ernest R. Duncan, Harmony Hill, Mount Harmony Road, Bernardsville, N.J. 07924

Filed June 24, 1974, Ser. No. 482,339
Int. Cl.² G09B 7/02
U.S. Cl. 35—9 A 31 Claims



1. A teaching machine having a display on which is shown the answer entered by a student to a visually readable statement of a problem, comprising:

entry means for allowing the student to enter an answer to the problem;

means for energizing the display to display the answer entered by the student into said entry means;

means for causing the answer shown on said display to visually differ in accordance with whether said answer is correct or incorrect, comprising:

means for generating the correct answer to the visually readable statement of a problem; and

means for comparing the answer entered by the student with said correct answer; and

means for receiving a record member having recorded thereon a visually readable statement of a problem and a machine readable answer to said problem; and

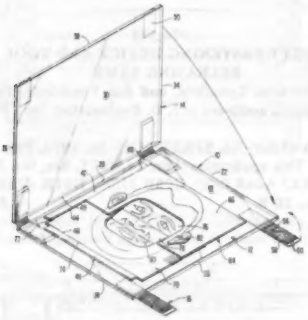
wherein said means for generating the correct answer includes means for reading a machine readable answer on a record member.

3,974,576

HOLDING FRAME FOR FACIAL IDENTIFICATION SYSTEM

William T. Quinn, III, 681 Park Ave., Freehold, N.J. 07728

Filed July 28, 1975, Ser. No. 599,484
Int. Cl.² G09B 1/30; G09F 11/06
U.S. Cl. 35—28 5 Claims



1. A holding frame for strips of flat material comprising an array of components making up a representation, the frame comprising:

a back plate, and a cover plate superposed over the back plate;

the back plate and cover plate including outer surfaces;

a series of affixation pads secured to the outer surfaces of the back plate and cover plate;

the affixation pads being arranged in superposed pairs;

a plurality of straps having means thereon for temporary adhesion to the pads; and

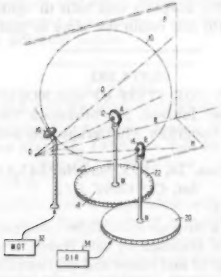
the straps being engaged on the pairs of pads to provide alternative hinge and closure means for the back plate and cover plate.

3,974,577

METHOD AND APPARATUS FOR THE ROTATION OF A SPHERICAL OBJECT AROUND A VIRTUAL AXIS PASSING THROUGH ITS CENTER

Arcady Brachlianoff, 12, rue de Gentilly, 92120 Montrouge, France

Continuation of Ser. No. 426,067, Dec. 19, 1973, abandoned.
This application July 28, 1975, Ser. No. 599,483
Int. Cl.² G09B 27/00; G09F 11/10; F16H 13/12
U.S. Cl. 35—46 R 9 Claims



6. An apparatus for rotating a generally spherical object about a virtual axis, orientable at will, passing through its center, comprising:

a. a mounting structure including three roller elements which press against the object and whose axes of rotation intersect said virtual axis;

b. drive means connected to one of said roller elements for driving said element about its axis of rotation, thereby causing rolling action without slipping between the object and all three roller elements, which, in turn, causes rotation of the object about its virtual axis; and

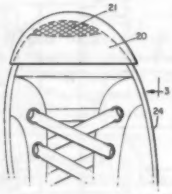
c. means connected to at least one of the other two roller elements for changing the orientation of the axis of rotation thereof and consequently the orientation of the virtual axis, in such a way that whichever is changed, at all times each of the axes of these roller elements intersects said virtual axis.

3,974,578

TENNIS SHOE TOE CUP

Peter E. Oettinger, 4 Phlox Lane, and Walter J. Bornhorst, 9 Magnolia Drive, both of Acton, Mass. 01720

Filed July 23, 1975, Ser. No. 598,242
Int. Cl.² A43B 13/22
U.S. Cl. 36—72 R 4 Claims



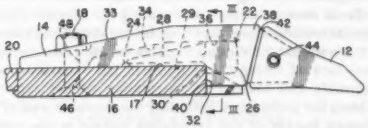
1. A toe cup which provides toe protection for a flexible shoe having a sole portion characterized by a predetermined elasticity, comprising a cup-shaped element having an elasticity substantially the same as said predetermined elasticity and having an inner and outer surface, each of said surfaces being a portion of a substantially convex surface of revolution about a reference axis, the angle subtended by each of said portions about said reference axis in a plane perpendicular to said axis being less than or equal to 180° and wherein said inner surface is concave and has a continuous smooth curvature.

3,974,579

BUCKET TOOTH ADAPTER SUPPORT AND LOAD TRANSFER MEANS

William J. Black, Wilmington, and William E. Lanz, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 4, 1975, Ser. No. 546,951
Int. Cl.² E02F 9/28
U.S. Cl. 37—141 T 5 Claims



1. A support and load transfer lug for a tooth adapter for mounting at the cutting edge of the tool of an earthworking machine, said tooth adapter having a longitudinally extending cylindrical bore, said tool defining an interior surface; the support and load transfer lug having a mating portion for closely mating said lug with said tooth adapter, and an attachment portion for affixing said lug to said tool, said attachment portion unitarily formed with said mating portion, said attachment portion comprising a tapered rearward extension having

a substantially flat surface for abutting the interior surface of said tool, said mating portion comprising a forwardly extending cylindrical portion formed to be slidably received in the longitudinally extending cylindrical bore of said tooth adapter, said cylindrical portion defining a shoulder at the juncture of said cylindrical portion and the attachment portion, the shoulder being at substantially a right angle to the flat surface of said attachment portion; said shoulder for abutting the cutting edge of said tool; whereby load forces imposed on said tooth adapter are transferred by said lug to said tool.

3,974,580

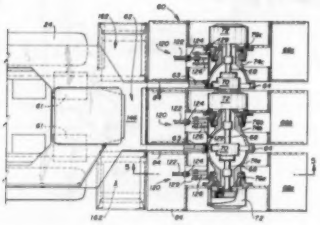
ALL ELECTRIC EXCAVATING AND LOADING SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Continuation-in-part of Ser. No. 435,296, Jan. 21, 1974, Pat. No. 3,896,571. This application July 17, 1975, Ser. No. 596,577

Int. Cl.² E02F *3/24*

U.S. Cl. 37—189 **18 Claims**



1. An excavating and loading system comprising:

an excavating wheel assembly comprising axle means and at least two rigid excavating wheels rotatably mounted cantilever on and supported on the axle means, said excavating wheel assembly having a width at least equal to the widest portion of the remainder of the system;

each of said excavating wheels including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel, each bucket having a cutting edge which extends to a stationary wall, and a wall mounted for pivotal movement from a material receiving position to a material dumping position;

supporting and housing means extending between the excavating wheels and connected to the axle means for supporting the excavating wheel assembly;

each of said digging buckets extending continuously between a side wall thereof located immediately adjacent to the supporting means and a side wall thereof defining one end of the excavating wheel assembly;

drive means including at least one electric motor and speed reducer means drivingly connecting the electric motor to the excavating wheel assembly for rotating the excavating wheels so that the digging buckets follow a circular path;

means located within the margins of the excavating wheel assembly and responsive to rotation of the excavating wheels for positively positioning the movable wall of each digging bucket of the excavating wheels in the material dumping position when the bucket is in the upper and rearward portion of the path;

a vehicle for supporting and manipulating the excavating wheel supporting means and thereby positioning the excavating wheel assembly in engagement with material to be excavated;

an engine mounted on the vehicle;

an electrical generator mounted on the vehicle and driven by the engine for supplying operating power for the electric motor; and

conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheels upon the positioning of the movable walls of the buckets in the material dumping position and a relatively high material delivery portion located rearwardly on the vehicle for the low portion.

3,974,581

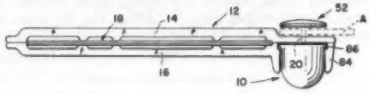
ANTI-THEFT FASTENING DEVICE AND TOOL FOR RELEASING SAME

Henry J. Martens, Lynnfield, and Jan Vandebult, Topsfield, both of Mass., assignors to I. D. Engineering, Inc., Peabody, Mass.

Division of Ser. No. 519,270, Oct. 30, 1974, Pat. No. 3,911,534. This application Apr. 14, 1975, Ser. No. 568,152

Int. Cl.² A44B *9/00*; G08B *21/00*; H01H *47/00*

U.S. Cl. 40—20 R **5 Claims**



1. A composite tag assembly comprising:

a. a tag including top and bottom tag cover sections rigidly secured together, one of said sections being formed with a tubular extension;

b. antenna means and diode means mounted between said tag cover sections, said antenna means including a first antenna leg and a second antenna leg electrically connected to said first antenna leg through said diode means, said diode means being mounted on said antenna means in such a manner as to increase the frequency received by said first antenna leg at a predetermined rate whereby said second antenna leg transmits said increased frequency for actuating an alarm circuit, and

c. a lock mounted in said tubular extension, said lock comprising a generally cylindrical non-metallic housing closed at one end; a ring mounted in said housing, said ring being formed with a downwardly and inwardly tapered inner surface; an insert formed of magnetic material loosely received within said housing, said retainer being formed with a conical lower end adapted to mate with said tapered surface of said ring, an axial bore, and at least one transverse opening formed in said conical end of said insert; a pin extending upwardly through said axial bore of said insert; a plurality of retaining balls disposed within said transverse opening of said insert, and resilient means for biasing said insert toward the open end of said housing thereby adapting said balls to tightly frictionally engage said pin and retain the same in said insert.

3,974,582

PLATEN FOR STRIP-UP MICROFICHE

Johannes Kristoffer Jantzen, Jr., Mountain View, Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

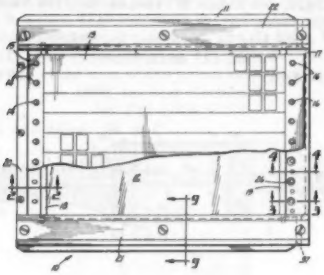
Filed Jan. 24, 1975, Ser. No. 543,813

Int. Cl.² G09F *3/12*

U.S. Cl. 40—106.1 **3 Claims**

1. A platen for a strip-up microfiche comprising a frame, a transparent carrier enclosed by said frame, a series of fixed holders in one edge of said frame and a series of independently movable holders in the opposite edge of said frame, wherein said fixed holders and said movable holders cooperate to hold a strip-up microfiche and said movable holders release said microfiche upon uniform serial movement of said movable holders, each of said movable holders is a latch assembly

comprising a pin, a pin support base having an upper and lower surface, and a groove in said lower surface and wherein



a resilient member is positioned in said grooves, said latch assemblies being biased against said resilient member.

3,974,583

PICTURE DISPLAY PANEL

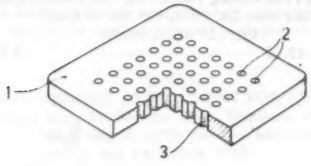
Johannes Van Esdonk; Johannes Petrus Hornman; Antonius Matheus Johanna Bluekens, and Mathieu Martinus Maria Petrus Mattheij, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 382,895, July 26, 1973. This application Feb. 10, 1975, Ser. No. 548,436

Claims priority, application Netherlands, Aug. 18, 1972, 7211382

Int. Cl.[2] G09F *13/20*

U.S. Cl. 40—130 E 3 Claims



1. A display panel comprising a first electrically insulating plate, a second light-pervious electrically insulating plate, and an apertured plate between said first and second plates, the surface of said apertured plate being covered with an electrically insulating material, said apertured plate comprising a criss-cross arrangement of strips having slots which extending transversely thereto, each strip at each cross-point thereof with another strip being positioned in a said slot in that other strip, the surfaces of said strips being provided with a phosphor layer luminescing in a desired color with alternate strips luminescing in different colors.

3,974,584

LIGHT ENCLOSURE FOR SUSPENDED CEILING

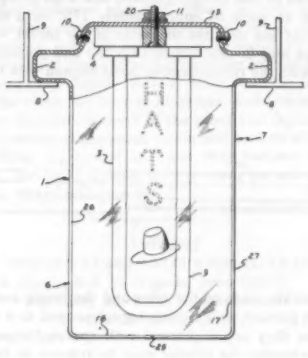
Richard A. Shorette, Crest Road, Monson, Mass. 01057

Filed Mar. 28, 1975, Ser. No. 563,150

Int. Cl.[2] G09F *13/04*

U.S. Cl. 40—130 R 2 Claims

1. In combination with a suspended ceiling having ceiling tiles supported on a framework of mutually perpendicular support bars, a unitary, self-contained light diffuser and advertising display comprising a hollow body formed of a translucent sheet material wholly enclosed except for an upwardly directed access opening, said body including an outwardly extending peripheral rim portion adjacent said opening for resting on rectangularly disposed support bars, said hollow body extending a substantial distance downwardly from said rim portion, a tubular light source fitted within said body through said opening and supported therein by a mounting plate affixed to said body adjacent its opening, said tubular light source being in the form of a loop with its lower end in



proximity to the lower inner surface of said body, the sheet material forming said body being continuous throughout except for said opening and thereby wholly enclosing said light source and advertising indicia disposed on the surface of said body for illumination by said light source.

3,974,585

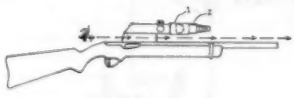
GUN SIGHT NIGHT LIGHTING ATTACHMENT

Charles W. Dunham, 6990 Matchette Road, Windsor, Ontario, Canada

Filed Oct. 24, 1974, Ser. No. 517,608

Int. Cl.[2] F41G *1/34*

U.S. Cl. 42—1 S 10 Claims



1. A gun sight lighting attachment for use with a gun sight of the type that operates on the principle of super-imposing an optical sighting image on a target as seen by the sighter comprising

an electric battery powered light emitting means,

a battery electrically connected to the battery powered light emitting means,

a light impermeable casing for housing the light emitting means and the battery, and adapted to be attached to the gun sight, and

a means for causing the light emitting from the light emitting means to be directed only on the means that generates the optical sighting image without permitting any extraneous light to reach the eye of the sighter.

3,974,586

FIREARMS ACCESSORIES

Frank M. Kappner, 4592 Orchard Lane, Cincinnati, Ohio 45236

Filed Apr. 24, 1975, Ser. No. 571,068

Int. Cl.[2] F41G *1/02*

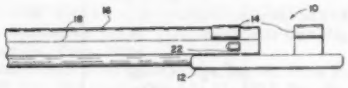
U.S. Cl. 42—1 S 2 Claims

1. A blinder for a shotgun type firearm having a barrel and a sighting rib extending along the barrel and held in an elevated position above the upper surface thereof by spaced posts and further having a front sight extending above the upper surface of the sighting rib and positioned generally

centrally thereof at the forward end of the barrel, said blinder comprising

a thin upright portion, and

a pair of spring clips spaced along and extending from the lower end of said upright portion, said clips being curved through an angle of approximately 270° on a diameter somewhat less than the diameter of the barrel, whereby the clips may be telescoped over the end portion of the barrel with the rib supporting posts aligned with the gaps



between the ends of the clips and the lower end of the upright portion, said clips being telescoped to a position wherein they are registered with spaces between said posts whereby the blinder may be rotated to bring the upright portion to abutting relationship with one side of the sighting rib,

said upright portion having a height and length sufficient to block the front sight from the view of one eye when the other eye is sighted down the barrel to aim the front sight at a target.

3,974,587

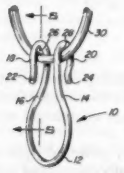
DETACHABLY FASTENABLE SWIVEL DEVICE

Bernice A. Levake, and Richard N. Levake, both of 814 Ash St., Spooner, Wis. 54801

Filed May 20, 1974, Ser. No. 471,179

Int. Cl.² A01K *91/04, 85/00*

U.S. Cl. 43—42.19 **7 Claims**



1. A detachably fastenable swivel device comprising: a single piece of wire having an intermediate portion and opposite end portions; said intermediate portion having a generally loop shaped configuration; said opposite end portions each having a substantially U-shaped hook like portion; each hook like portion of said opposite end portions being substantially parallel with and adjacent to each other; said hook like portions of each of said opposite end portions also being directed in opposed relation to each other; said opposite end portions also being slightly spaced apart where they are substantially parallel with each other; each of said hook like portions is provided with a shank portion and a hook end portion; each hook like portion having a generally arcuate concave bearing portion between said shank portion and said hook end portions; said shank portion being spaced from said hook end portion a distance substantially less than twice the radius of said generally arcuate bearing portion.

3,974,588

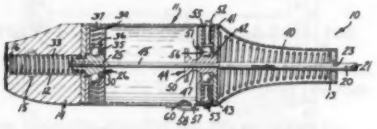
FISHING LURE WITH SELF-SETTING CAPABILITY

Gerald E. Blom, 8020 Portland Ave. South, Bloomington, Minn. 55420, and Robert W. VanLeuven, 2148 Nancy Circle, Eagan, Minn. 55111

Filed July 14, 1975, Ser. No. 595,573

Int. Cl.² A01K *97/00*

U.S. Cl. 43—15 **10 Claims**



1. A fisherman's lure, comprising, in combination:

a housing having means at one end thereof for engaging a line;

a hook shaft slideable in said housing and extending outwardly from the other end thereof to receive a hook;

holding means releasably retaining said shaft in a retracted position in said housing;

and means in said housing effective upon release of said shaft from said holding means for automatically first projecting the shaft further from said housing and then violently returning said shaft to said retracted position.

3,974,589

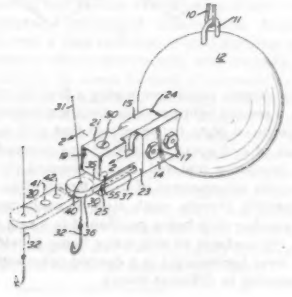
FISHING LINE RETENTION DEVICE

Walter J. Henze, and San Thein, both of Philadelphia, Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed Mar. 28, 1975, Ser. No. 563,065

Int. Cl.² A01K *95/00*

U.S. Cl. 43—43.12 **6 Claims**



1. A fishing line retention device for attachment to a weight carried by a line from a trolling apparatus and for attachment to a fishing line which comprises

a one piece body secured to said weight,

a tongue detachably carried by said body having a hole beyond said body through which said fishing line is slidably disposed,

said tongue being rectangular in transverse cross section and having an upper face,

said body having a complemental horizontal slot into which said tongue extends,

said tongue having an upper face with a recess therein, and

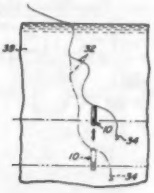
said body having a spring loaded member engageable in said recess in tongue retaining position.

3,974,590

SUBMERSION DEVICE WHICH CHANGES CONFIGURATION IN RESPONSE TO TEMPERATURE

George R. Boone, 4730 Ridgebury Drive, Dayton, Ohio 45440

Continuation of Ser. No. 187,389, Oct. 7, 1971, Pat. No. 3,753,311. This application Aug. 16, 1973, Ser. No. 388,715
The portion of the term of this patent subsequent to Aug. 21, 1990, has been disclaimed.
Int. Cl.[2] A01K 93/00
U.S. Cl. 43—43.14 1 Claim



1. A device adapted to be submerged within a fluid of varying temperature regions, a hollow body member having a movable wall portion, movement of the movable wall portion changing the displacement volume of the device within the fluid, resilient means within the hollow body member and operable upon the movable wall portion and urging movement of the movable wall portion to increase the displacement volume of the hollow body member, a thermally responsive actuator operably joined to the movable wall portion and operable upon subjection of the device to temperatures above a predetermined value to move the movable wall portion to decrease the displacement volume of the hollow body member, the device having a weight generally equal to the volume of fluid displaced by the device when the device is submerged within the fluid in a predetermined temperature region.

3,974,591

CHUM DISPENSING ATTACHMENT FOR FISHING RIGS

Otis Eugene Ray, 10000 Park Blvd., Seminole, Fla. 33542

Filed Aug. 4, 1975, Ser. No. 601,519
Int. Cl.[2] A01K 97/02
U.S. Cl. 43—43.14 1 Claim

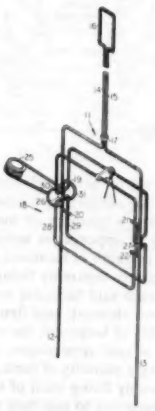
1. A chum holder and dispenser for use alternately with a float in surface fishing and with a sinker in bottom fishing, said chum holder and dispenser comprising a substantially cylindrical hollow plastic body having symmetrically conically tapered end portions, said body having a multiplicity of perforations arranged to cover a major portion of its total surface, said body formed in two substantially semi-cylindrical half sections and said half sections hingedly connected along corresponding longitudinal edges inwardly of and between the conically tapered end portions, releasable snap fastener means on the opposite corresponding longitudinal edges of said half sections enabling the half sections to be closed around a mass of chum and around either a float element or a sinker element, diametrically opposing integral post elements on the interiors of said conically tapered end portions near the opposite end extremities of said body, the post elements of one half section having longitudinally aligned grooves for the snug reception of a fishing line or leader extending axially through the chum holder and dispenser and said aligned grooves having their axes coinciding with the longitudinal axis of the chum holder and dispenser, said last-named post elements having axially aligned enlarged resilient socket openings immediately above said grooves and slightly laterally offset from the longitudinal axis of the chum holder and dispenser, and coacting locking heads on the post elements of the other half section adapted for snap locking engagement within said sockets when the two half sections are closed and said snap fastener means are engaged, said locking heads then pressing on said fishing line or leader within said grooves.

3,974,592

FORKED STAKES FOR ANIMAL TRAPS

Stanley E. Staats, R.R. 2, Wapello, Iowa 52653

Filed July 23, 1975, Ser. No. 598,197
Int. Cl.[2] A01M 23/26
U.S. Cl. 43—88 3 Claims



1. A forked stake for setting rotating-frame animal traps in trails, said traps being the type having a pair of frames with two opposite pivotal points, said stake comprising:

first and second prongs spaced apart approximately the distance between said pivotal points of one said traps with which said stake is to be used, said prongs being substantially parallel while in position to hold said trap, one end of each of said prongs to be pressed into the ground,

a pair of pegs protruding from each of said prongs in a lateral direction toward the opposite one of said prongs, said pegs being positined at points spaced from said end of the respective one of said prongs, said pegs of each pair being spaced apart sufficiently to permit one of said pivotal points to fit readily therebetween, each of said pegs being long enough to extend into space between said pair of frames of one of said traps while said frames are in their set position,

spring means extending between said prongs, said spring means urging said prongs apart sufficiently to permit each of a said pairs of pegs to be positioned for straddling different one of said pivotal points,

retaining means movable to a first position to permit said prongs to be spread apart by said spring means and movable to a second position to bring said prongs toward each other sufficiently to cause said pegs to be inserted between said frames, and said inwardly positioned prongs

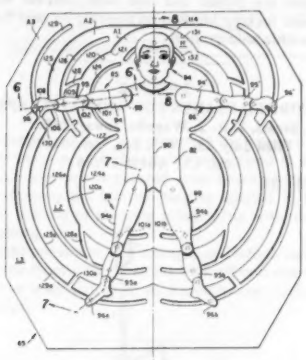
adapted to position said trap in a trail according to the distance said prongs are pressed into the ground.

3,974,593

FIGURE WITH MOVABLE LIMBS, AND BASE FOR MOUNTING SAME

Wilmer David Walker, Jr., 1316 Sharon St., N.W., Atlanta, Ga. 30314

Filed Apr. 3, 1975, Ser. No. 564,827
Int. Cl.² A63H 3/16
U.S. Cl. 46—22 6 Claims



1. A construction toy for selectively forming a figure having a central body, said toy comprising a base member representing said central body, a plurality of locations on said base member, a plurality of appendages selectively separably fixable to each of said plurality of locations, a plurality of fastening means for selectively separably fixing said appendages to said base member, each said fastening means including a first element and a second element, said first element being fixed at one of said plurality of locations, the other of said elements being fixed to one of said appendages, at least some of said appendages including a plurality of parts, and fastening means for selectively separably fixing each of said plurality of parts to another of said parts and to said base member, each of said fastening means including a male member and a female member, said male member being rotatable with respect to said female member, and including means for supporting said figure, said supporting means and said appendages including coacting guide means for constraining the motion of each of said appendages, and including a first level for receiving said base member, and a second level higher than said first level for receiving one of said parts of said appendages, a first guide means comprising a groove in said second level, and a pin extending from said part into said groove.

3,974,594

ELEVATOR TEE DEBURRING DEVICE

Stanley T. Urbank, New Eagle, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 21, 1975, Ser. No. 597,952
Int. Cl.² B24B 7/02
U.S. Cl. 51—3 10 Claims

1. Apparatus for the in-line simultaneous grinding of opposite facing surfaces of a workpiece on a fabricating line comprising:

a. a frame;

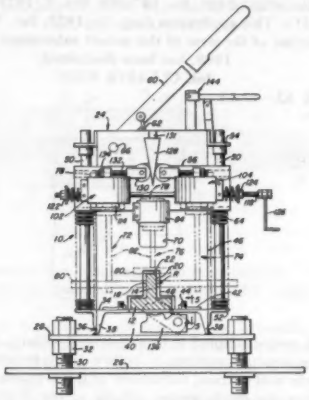
b. means for fixedly supporting a workpiece with respect to said frame;

c. a crosshead movably mounted on said frame;

d. means for moving said crosshead alternately toward and away from said workpiece;

e. a pair of oppositely spaced motor operated grinding wheels carried by said crosshead;

f. spring means carried by said crosshead to urge said grinding wheels toward one another into engagement with said



workpiece during movement of said crosshead toward the same; and

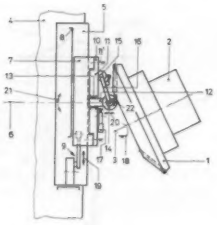
g. cam means on said frame for moving said grinding wheels away from one another during movement of said crosshead away from said workpiece.

3,974,595

GEAR GRINDING MACHINE FOR SPIRAL BEVEL GEARS

Albin Wolf, Augsburg, and Franz Weigant, Kissing, near Augsburg, both of Germany, assignors to Fa. Zahnraderfabrik Renk AG, Augsburg, Germany

Filed Jan. 31, 1975, Ser. No. 546,037
Claims priority, application Germany, July 12, 1974, 2433603
Int. Cl.² B24B 9/00
U.S. Cl. 51—5 D 9 Claims



1. In an apparatus for grinding the curved flanks of gear teeth of a bevel gear having means to continuously rotate the gear and means to reciprocate a slider carrying a grinding tool the full length and beyond each tooth while means to oscillatingly rock the slider so as to impart the desired curve to the tooth, the improvement comprising:

mounting means for releasably securing said grinding tool on said apparatus in either of a pair of 180° reversed positions, said tool being a rotatable grinding wheel having at least one frustoconical grinding face engageable with a tooth flank and rotatable about an axis;

means for displacing said wheel along said axis and securing same at any desired position therealong; and

drive means for rotating said grinding wheel including a drive motor carried on said slider, a pulley fixed to said

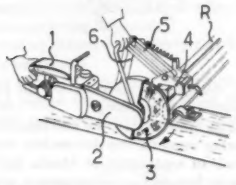
wheel and rotatable about said axis, and a flat belt extending between said motor and said pulley.

3,974,596

MACHINE TOOL FOR CUTTING-OFF RAILS

Jean Huboud-Peron, La Tour-du-Pin, France, assignor to Societe des Anciens Establissements L. Geismar, Neuilly-sur-Seine and Societe Turripinoise de Mecanique Stumec, Saint-Didier-de-la-Tour, both of, France

Filed Mar. 19, 1975, Ser. No. 559,875
Claims priority, application France, Apr. 9, 1974, 74.12377
Int. Cl.² B23B *23/02*
U.S. Cl. 51—178 **6 Claims**



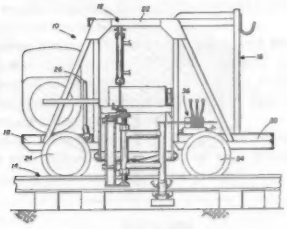
1. A machine-tool for cutting off rails, comprising a prime mover carrying arm, a grinding wheel rotatably mounted on said arm and driven by said prime mover, and a holder to be secured by a vise onto a rail to be cut off, wherein said holder comprises a first arm pivotally mounted at one end thereof onto said vise about an axis parallel with said rail, a second arm pivotally mounted at one end thereof onto said first arm about an axis parallel with said rail, said holder and said prime mover carrying arm further comprising means for pivotably mounting said prime mover carrying arm on either side thereof onto the other end of the second arm of said holder whereby the rail may be cut from either side alternatively.

3,974,597

RAIL BASE GRINDING METHOD

Lester N. Hambrick, 121 Woodland Drive, Irving, Tex. 77009, and Carl C. Flowers, 2872 Alden Ave., Dallas, Tex. 75211

Division of Ser. No. 376,882, June 29, 1973, Pat. No. 3,908,317, which is a continuation of Ser. No. 169,986, Aug. 9, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,692
Int. Cl.² B24B *1/00*
U.S. Cl. 51—281 R **11 Claims**



1. In a process for welding the rails of a trackway comprising metal rails supported by metal tie plates on wooden ties which are in turn supported on a ballast roadbed of the type wherein a tie is first moved laterally relative to the roadbed to expose the adjacent end of a pair of rails comprising the trackway, and a welded joint is subsequently formed between the adjacent ends of the rails, the improvement comprising:

manipulating a grinding apparatus having an upper grinding surface in the space between the bottom surfaces of the joined rails and the upper surface of the ballast of the roadbed that was previously occupied by the tie and thereby removing weld flashing projecting below the bottom surfaces of the rails;

subsequently repositioning the tie between the bottom surfaces and the roadbed;

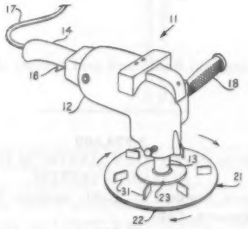
both of the foregoing steps being carried out without disturbing the ballast of the roadbed and thereby facilitating the return of the trackway to service.

3,974,598

BACKING DISC WITH MEANS TO EXPEL ABRADED PARTICLES

Joseph L. Guidry, 1572 Hampton Way, Santa Rosa, Calif. 95401

Filed Apr. 8, 1974, Ser. No. 459,113
Int. Cl.² B24D *13/18*; B24B *23/02*; B24D *9/08*
U.S. Cl. 51—358 **6 Claims**



1. In a backing disc that is to be rotated in a predetermined direction and has an abrasive material engaging a front face thereof, a plurality of blades disposed on the rear surface of said disc about the circumference thereof and spaced inwardly of the disc periphery and spaced from the center of the disc, said blades each having a substantially rectangular flat planar configuration with the plane thereof being substantially normal to the disc and each of said blades being disposed in angular offset relation to a radius of the disc in trailing relation to the direction of rotation of the disc.

3,974,599

UNDERGROUND REINFORCED PLASTIC ENCLOSURE

James L. Grosh, Los Altos, Calif., assignor to Indian Head Inc., New York, N.Y.

Continuation of Ser. No. 205,991, Dec. 8, 1971, abandoned. This application Mar. 20, 1975, Ser. No. 560,372
Int. Cl.² E02D *29/14*
U.S. Cl. 52—20 **11 Claims**

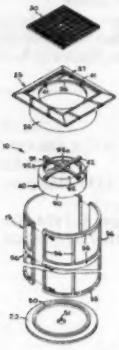
1. An enclosure for underground installations comprising:

a body of fiberglass material;

stiffeners on said body for rigidifying said body, said stiffeners being of reinforced plastic mortar; and

a top cap on said body of reinforced plastic mortar, said top cap being formed with a central opening communicating with said body, said top cap being formed with radially disposed grooves projecting radially from said central

opening and comprising a baffle and a tamper shield having radially disposed arms seated in said grooves for



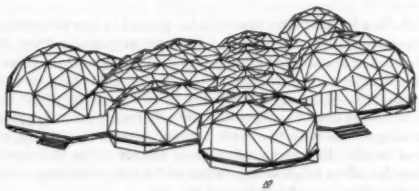
supporting said baffle and said tamper shield from said top cap.

3,974,600

MINIMUM INVENTORY MAXIMUM DIVERSITY BUILDING SYSTEM

Peter J. Pearce, Studio City, Calif., assignor to Synestructics, Inc., Chatsworth, Calif.

Continuation of Ser. No. 176,220, Aug. 30, 1971, abandoned.
This application Mar. 25, 1974, Ser. No. 454,265
Int. Cl.[2] E04B 1/32
U.S. Cl. 52—81 89 Claims



1. A triangulated convex dome structural module erected upon a planar base comprising:

a. a first regular hexagon in a first plane having sides equal to unit length A;

b. a series of six isosceles triangles, the sides of which meet in pairs at the vertices of said first regular hexagon, said sides of said first hexagon defining the base sides of said triangles, the apices of said triangles falling at points which define the vertices of a second, not necessarily planar, hexagon positioned above said first regular hexagon, the centers of said hexagons being vertically aligned; the sides of said triangles being equal in length to $A\sqrt{6/4}$, the sides of said second hexagon being equal to $A\sqrt{3/3}$; and

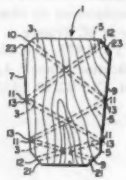
c. six additional members connecting a central apex that is directly above said vertically aligned centers of said first and second hexagons to the said second hexagon.

3,974,601

MULTI-BLOCK SUPPORT CONSTRUCTION

Ernest H. Steadman, Rte. 2, Box 183, Ponchatoula, La. 70454

Filed Apr. 4, 1975, Ser. No. 565,122
Int. Cl.[2] E04B 1/32; E04C 3/10
U.S. Cl. 52—86 13 Claims



1. A modular, multi-block construction for placement between anchor members comprising:

a series of at least three blocks, the end blocks of said series of blocks being mounted on the anchor members, each internal block of said series of blocks having opposite facing sides in face-to-face engagement with the facing sides of the adjacent blocks, and opposite exterior sides, and a top and an opposite bottom, said facing sides, said top and said bottom, and said exterior sides being joined together forming the outsides of the block, and at least two sets of at least three diagonally disposed channels each therein, each set being offset from the other and extending in diagonally opposite directions from the other through at least substantially the full width between said opposite facing sides of each block, each angularly disposed channel being in continous, line alignment with a mating channel in at least two adjacent blocks, each set of aligned, mating channels extending at least substantially through the full height between the top of one block and the bottom of another block at least one block removed from said one block; and

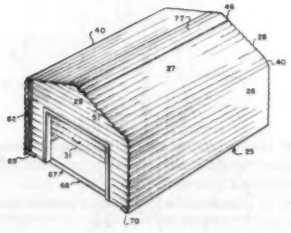
---

3,974,602

MONO-COQUE BUILDING STRUCTURE AND METHODS

Robert Pohl, Rte. 2, Hallettsville, Tex. 77964, and Bascom Nelson, Box 24, Mineral, Tex. 78125

Filed Feb. 10, 1975, Ser. No. 548,542
Int. Cl.[2] E04H 1/02; E04B 7/02
U.S. Cl. 52—93 8 Claims



1. A mono-coque building structure comprising:

A. an integral frame structure comprising:

1. a first base stringer projecting the length of said building,

2. a second base stringer projecting the length of said building,

3. a plurality of free-standing ribs uniformly projecting upward from said first and said second base stringers,

4. said free-standing ribs formed from C channel comprising:
   a. a first diagonal cut extending partially through said C channel,
   b. a second diagonal cut spaced from said first diagonal cut and projecting substantially through said C channel,
   c. the extension of said C channel from said first diagonal cut comprising a leg segment,
   d. the extension of said C channel from said second diagonal cut comprising a rafter segment,
   e. an interconnecting segment interconnecting said first diagonal cut and said second diagonal cut,
   f. a bend formed in said C channel further comprising,
   g. a first overlap formed by the overlapping said leg segment and said interconnecting segment,
   h. a second overlapping of said rafter segment and said interconnecting segment,
   i. a securing means for securely attaching said overlapping segments,

B. an outer skin enclosing said frame structure, and

C. securing means for firmly attaching said outer skin to said frame structure forming a mono-coque structure.

3,974,603

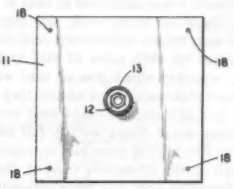
CONCRETE WALL BRACING METHOD AND APPARATUS

Richard K. Vandegriff, Noblesville, Ind., assignor to Vantage Construction Company Inc., Noblesville, Ind.

Continuation of Ser. No. 383,512, July 30, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,207

Int. Cl.² E04B *1/41*

U.S. Cl. 52—166 **4 Claims**



1. Wall bracing apparatus for use in the ground comprising:
a plate having first fastener means affixed thereto;
an elongated member extending generally perpendicular to the plane of the plate and having second fastener means at one end thereof cooperating with said first fastener means to secure said plate and said member together, and said member having lateral offset means at the other end thereof for anchorage;
first spacer means affixed to the plate and extending from the plate toward the offset means and surrounding a portion of the member from said plate to the end of the spacer remote from the plate whereby said spacer means serves as a first shield; and
a solidified mass disposed in the ground remote from said plate and affixed to a portion of said offset means, and anchoring said member in the ground.

3,974,604

EASY ANCHOR

John L. Conn, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Sept. 25, 1974, Ser. No. 509,081

Int. Cl.² E02D *5/74*

U.S. Cl. 52—160 **1 Claim**

1. In an easy anchor, the combination of a hollow outer post, and a hollow inner post snugly slidable into said outer post, each said post being of similar cross sectional configuration, the upper ends thereof being left open, a lower end of said outer post being tapered to a point of inverted pyramid shape including transverse slots provided at the beginning of the tapered portion of said lower end, said inner post having resilient tongues at its lower end aligned with said slots for sliding and bending outwardly through said slot when said inner post is pushed inside said outer post, said tongues normally spreading slightly when in a relaxed position, each said tongue having a tapered point, the portion of the inner post above the tongues being of the same length as the untapered portion of the outer post, said upper ends of said posts having

a plurality of transverse openings for alignment so to receive a transverse bolt and lock nut, including a strap being passed around a center of said bolt, said strap serving for attachment to any structure that is intended to be secured against a high wind, wherein an inner sleeve is affixed within the spaced from said outer post, said sleeve being secured at its lower end to said post and having same cross sectional shape as said posts, wherein the inner post being dimensioned to fit snugly and slidably between said outer post and sleeve, said slots being formed between said outer post and said sleeve, including upwardly disposed bent-out spurs extending from said tongues to resist removal of said inner post.

3,974,605

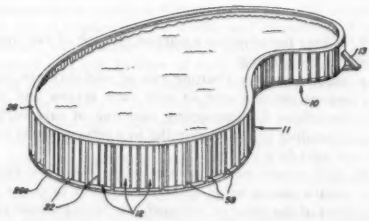
WALL STRUCTURE AND SWIMMING POOL CONSTRUCTION

Gordon Wesley Beatty, Guelph, and Douglas Charles Young, Toronto, both of Canada, assignors to Elcon Manufacturing Company Limited, Scarborough, Canada

Continuation-in-part of Ser. No. 477,896, June 10, 1974. This application Nov. 22, 1974, Ser. No. 526,084

Int. Cl.² E02D *27/00*

U.S. Cl. 52—169 R **13 Claims**



1. A demountable swimming pool construction comprising

a plurality of monolithic modular interlocking units which comprises:

a. a base section having a plurality of longitudinal, generally parallel, channels formed therein, including a wall receiving channel;

b. a top section of similar construction and spaced from the base section; and

c. a wall section extending between the base and top sections and disposed in the said respective wall receiving channels thereof, said wall section comprising a plurality of monolithic, generally rectangular wall panel elements formed of thermoplastic material, the outer surfaces thereof being substantially the normal density of the thermoplastic material and the interior portion in cross section having a cellular core of reduced density, each of said panels having an interior surface and an exterior reinforcing surface having reinforcing ribs integrally formed thereon, and interlocking tongue and groove means on the respective opposed side edges thereof which are interlocked with other panels to thereby form a jointed, locked wall, the said tongue and groove means each having additional securing means extending rearwardly of the reinforcing surface to form an edge joint assembly, and a plurality of supplementary securing means having a slot means formed therein to secure the rearwardly extending joint assembly.

3,974,606

LINER FOR COVERING INTERSECTING SURFACES

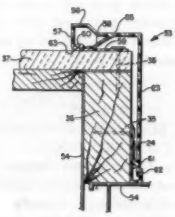
Joseph N. LaBorde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 365,456, May 31, 1973, Pat. No. 3,902,292, which is a division of Ser. No. 191,871, Oct. 22, 1971, Pat. No. 3,797,185. This application Dec. 23, 1974, Ser. No. 535,518

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.[2] E04F *19/02*

U.S. Cl. 52—288 **11 Claims**



1. A liner for covering a portion of each of two intersecting surfaces comprising:

a. face means for abutting one of said surfaces, projection means on one end of said face means and extending therefrom for contacting said one of said surfaces and extending generally parallel to a return means connected to said face means;

b. said return means connected to said face means, said return means being so constructed as to cover at least a part of the other of said surfaces; spring means connected to the inner surface of said return means for contacting said other of said surfaces, and storm sash track means connected to the exposed side of said return means.

3,974,607

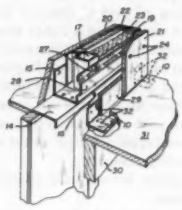
FIRE-RATED COMMON AREA SEPARATION WALL STRUCTURE HAVING BREAK-AWAY CLIPS

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Oct. 21, 1974, Ser. No. 516,302

Int. Cl.[2] E04C *2/00;* **E04B** *1/40*

U.S. Cl. 52—232 **7 Claims**



1. A fire-rated common area separation wall structure comprising:

1. a vertical fire barrier member comprising:

a. floor and ceiling runners,

b. a plurality of steel studs mounted in said runners having panel engaging means provided therein, and

c. at least one layer of gypsum wall panels mounted intermediate said studs and engaged by said panel engaging means,

2. a pair of wood frames one on each side of said vertical fire barrier member having an outer wall member affixed thereto, and

3. a plurality of break-away clips formed of a metal which melts or burns when subjected to heat at the temperature of a burning wood frame wall, said clips being substantially the sole means connecting said steel studs to said wood frames on both sides of said vertical fire barrier member, whereby when one of said wood frame walls burns, the break-away clips connecting said fire barrier member to said burning wood frame wall fail, permitting said burning wood frame wall to fall away and collapse while said fire barrier member is retained by the wood frame wall on the other side thereof, thereby preventing the fire from the first wall from spreading to the second wall.

3,974,608

PANEL WALL CONSTRUCTION

Kenneth R. Grearson, Park Ridge, Ill., assignor to Multuloc Corporation, Chicago, Ill.

Filed Oct. 23, 1975, Ser. No. 625,147

Int. Cl.[2] E04B *2/38*

U.S. Cl. 52—235 **14 Claims**

1. A panel wall construction of the type having alternating panels and panel carrying structural members comprising:

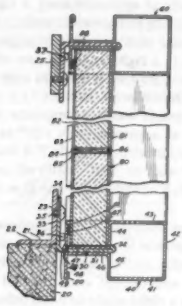
spaced sheet metal structural shapes of generally box-tee shape having three adjacent box walls, the fourth box wall being split into two segments, opposing legs extending away from the box section at about 90° from the ends of the split box walls for a distance to accommodate desired panels, the outer end of said legs extending away from each other forming flanges at about 90° to said legs and forming a channel to accept the edges of a wall panel;

lower sill sheet metal structural shape having the same design as said spaced shapes;

upper cap sheet metal structural shape having the same design as said spaced shapes;

said sill shape and cap shape aligned with said spaced shapes to accept a panel in said channel locking said spaced shapes, sill shape and cap shape into a rigid structure without separate fasteners;

panels in said channels of each adjacent said spaced structural shapes and adjacent sill shape and cap edge; and



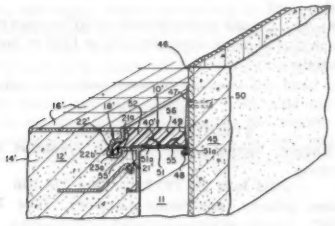
corner sheet metal structural shape assemblies comprising two of said sheet metal box-tee shapes having one flange of one shape inserted into the slot between opposing legs of the other box-tee shape.

3,974,609

EXPANSION JOINT COVER

Julian J. Attaway, Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed July 16, 1975, Ser. No. 596,271
Int. Cl.[2] E04B 1/66
U.S. Cl. 52—273 18 Claims



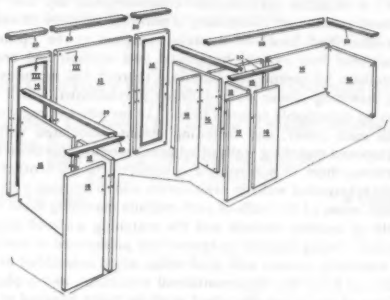
1. An expansion joint cover for sealing off a space between first and second structural bodies, said expansion joint cover comprising, first and second side members, and bridging and elastomeric sealing means, said first and second side members being adapted for being secured to first and second structural bodies, respectively, said first side member including wall structure comprising, an intermediate wall portion having first and second leg wall components and a bight wall component interconnecting said first and second leg wall components and there being a recess defined by said first and second leg wall components and said bight wall component, an outer wall portion connected with said first leg wall component and adapted to lead adjacent to an outside face of a first structural body, and an inner ledge wall portion adapted to lead adjacent to a space between first and second structural bodies, an end of said inner ledge wall portion forming a constricted entrance into said recess with said first leg wall component, and there being a bearing surface of said inner ledge wall portion set off across said constricted entrance from said first leg wall component of said intermediate wall portion; and said bridging and elastomeric sealing means including, bridging wall means supported by said first and second side members and forming a cavity with said first and second side members having said cavity commuicate with said recess through said constricted entrance, said bridging wall means having a first end portion resting slidably upon said bearing surface of said inner ledge wall portion in said cavity, and said bridging wall means being covered by bond-inhibitor means in said cavity, and said bridging and elastomeric sealing means further comprising, anchor means connected with said bridging wall means and in said cavity, and an elastomeric sealing member molded and cured in said recess and cavity and bonding said first and second side members together in said cavity and substantially filling said recess and cavity, and embedding said anchor means in said cavity and anchoring to said first side member in said recess through said constricted entrance while being inhibited against bonding to said bridging wall means in said cavity.

3,974,610

PARTITION SYSTEM

Charles F. Logie, Spring Lake, Mich., assignor to American Store Equipment Corporation, Muskegon, Mich.

Filed Jan. 29, 1975, Ser. No. 544,973
Int. Cl.[2] E04B 1/48
U.S. Cl. 52—285 8 Claims



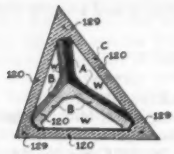
1. A panel assembly having a pair of panels joined along abutting surfaces comprising a first panel having a centerline, a pair of generally opposite side surfaces and a first end surface extending generally transverse to both said centerline and said side surfaces; a second panel having a centerline, a pair of generally opposite side surfaces, and a second end surface extending generally transverse to both said second panel centerline and second panel side surfaces; a first aperture in said first end surface and a second aperture in said second end surface, said first and second apertures each having respective centerlines, being substantially parallel to the centerline of said first and second panels respectively and having substantially equivalent transverse dimensions; the transverse widths of said first and second end surfaces being substantially equal at least at the position of said first and second aperture centerlines; an elongated connecting pin received in and extending between said first and second apertures for securing said panels together with said end surfaces abutting one another; said pin having a uniform width less than said transverse width of said apertures to create a tolerance between said aperture and said pin of predetermined width; said centerline of said first aperture being offset from said centerline of said first panel toward one side surface of each first panel a distance equivalent to one-half said tolerance; said centerline of said second aperture being offset from said centerline of said second panel toward one side surface of said second panel a distance equivalent to one-half said tolerance; securing means in each panel for tightening said connecting pin against the wall of each of said apertures which is farthest away from the said one surface of that respective panel whereby when said panels are joined, said side surfaces on said panels are substantially aligned and flush with each other regardless of whether said panels are assembled with the said one side surfaces thereof on the same or opposite sides of said panel assembly.

3,974,611

MODULAR ARCHITECTURAL EDUCATIONAL TOY AND PLAYGROUND ERECTOR-SET AND BUILDING SYSTEM

Edward W. Satterthwaite, 418 S. Hutchinson St., Philadelphia, Pa. 19147

Filed Mar. 26, 1973, Ser. No. 345,217
Int. Cl.² E04C 1/10
U.S. Cl. 52—309 46 Claims



1. A modular architectural-constructional toy and playground erector-set comprising a plurality of some of the below-described kinds of modules adapted to be optionally assembled into various horizontal and vertical and angular structures by various combinations thereof, the modules having matching planar walls defining polyhedrons, which walls may be detachably secured to each other when in registration with each other, and fastening means associated with the juxtaposed matching walls of adjacent modules for detachably securing them in non-rotable orientation to each other with their juxtaposed walls in registration and in contact with each other, some of the walls of each module matching some of the walls of another module and the matching walls of adjacent modules being adapted to operatively juxtaposed to and to be in matching contact with each other when assembled to each other to form the aforementioned structures, and a plurality of one of the below-described modules being adapted to form one of the below-described derivative modules composed thereof:

(P) a Primary tetrahedron module P

having one wall A which is a right-angled isosceles triangle whose angles are approximately 90°, 45° & 45°, respectively,

having two walls B, each of which is a right-angled triangle whose angles are approximately 90°, 55° & 35°, and

having one wall C which is an isosceles triangle whose angles are approximately 70°, 55°, & 55°,

(S-1) a Secondary tetrahedron module S-1 derivable from two P modules by placing the A walls thereof in registration and in full contact with each other,

having two C walls at approximately a right angle to each other which are the original C walls of two P modules or the equivalents thereof (hereinafter designated as the oC walls), and

having two C walls at approximately a right angle to each other, each of which is composed or the equivalent of two coplanar B walls of opposite P modules (hereinafter designated as dC walls), each dC wall being at approximately a 60° included angle to an adjacent oC wall, (S-2) a Secondary tetrahedron module S-2 derivable from two P modules by placing in registration and in full contact with each other one B wall of one P module and one B wall of the other P module, such S-2 module

having a triangular D wall composed or the equivalent of two coplanar A walls, the angles of such triangular D walls being approximately at 90°, 45° & 45°,

having two C walls which are the same as or the equivalents of the two oC walls of the two P modules, and

having one E wall which is an isosceles triangle composed or the equivalent of two B walls with their shortest boundary-lines adjacent to each other, the angles of such triangular E wall being approximately 110°, 35° & 35°,

(S-3) a Secondary hexahedron module S-3 derivable from two P modules by placing the two C walls in registration and in full contact with each other, and

having two A walls at approximately a right angle to each other along their hypothenuses, and

having four B walls, with one pair of adjacent B walls each at approximately a right angle to one of the A walls and with the opposite pair of B walls at approximately a right angle to the other A wall, and

having the adjacent B walls on opposite sides of the plane of the C walls at approximately 120° to each other,

(T-1) a Tertiary pentahedron module T-1 derivably by placing any C wall (an oc wall or a dC wall) of one S-1 module in registration and in full contact with any C wall of the other S-1 module

having a rhombus-shaped F wall composed or the equivalent of four coplanar B walls or two coplanar C walls, and

having four C walls, each at approximately 60° to the plane of the F wall and two of each pair of C walls being at approximately a right angle to each other and two of each pair of each differently paired C walls being at approximately 120° to each other,

(T-2) a Tertiary pentahedron module T-2 derivable by placing the E walls of two S-2 modules in registration and full contact with the other,

having one square G wall composed or the equivalent of four coplanar A walls, and

having four C walls each at approximately 45° to the G wall and each at approximately 120° to its adjacent G wall,

(T-3) a Tertiary septahedron module T-3 derivable from S-3 modules by placing two A walls thereof in registration and in full contact with each other,

having one square H wall which is composed or equivalent to the two coplanar A walls, and

having four B walls approximately at right angles to each other, and

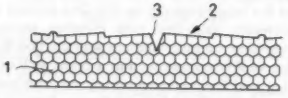
having two C walls approximately at 90° to each other, and each C wall being approximately at 120° to the adjacent B walls.

3,974,612

STRUCTURAL E!.EMENT

Karl Karner, Metzlerstrasse 39, D-6 Frankfurt am Main, Germany

Filed June 29, 1973, Ser. No. 375,186
Claims priority, application Germany, June 29, 1973, 2232567
Int. Cl.² E04B 5/46
U.S. Cl. 52—309 15 Claims



1. An insulating structural or building element comprising a sheet or panel of thermo-plastic foamed material and a first metal sheet or plate provided with at least an outer surface roughness comprising a plurality of perforations, and having at least one rib, as a stiffening insert and carrier base, and having inner and outer surfaces, the inner surface being welded to said sheet of plastic foamed material by heating at least said rib of said plate beyond the melting point of the plastic foam and pressing at least said heated portion of said plate into the plastic foam, thereby fusing or welding same together; and the outer surface of said plate including said

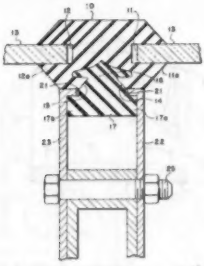
perforations adapted to provide adhesion for plaster, mortar or the like applied thereto.

3,974,613

CURTAIN WALL GASKET

Homer C. Criswell, 2608 Black Oak Lane, Arlington, Tex. 76012

Filed Oct. 17, 1972, Ser. No. 298,309
Int. Cl.² E04B 1/62; E06B 3/62
U.S. Cl. 52—400 5 Claims



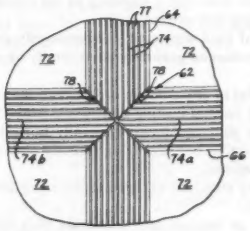
1. A curtain wall support including a gasket comprising:
a. an elongated elastomeric body having a first longitudinal groove disposed along one side thereof and a wedge-receiving recess disposed along another side thereof, the plane of said wedge-receiving recess being approximately normal to the plane of said first longitudinal groove; and
b. wedge means adapted to mate with said wedge-receiving recess, said wedge means comprising an elongated body of T-shaped cross section, the base of said wedge means adapted to mate with said wedge-receiving recess and the head of said wedge means extending from the gasket body to define mounting grooves between the head of said wedge means and said elongated body, said mounting grooves adapted to mate with means for mounting and supporting said gasket, at least one of said mounting grooves paralleling said first longitudinal groove.

3,974,614

EXPANSION-CONTRACTION JOINT

Gardner H. Strong, 22 Olive Ave., Piedmont, Calif. 94611

Continuation-in-part of Ser. No. 275,758, July 27, 1972. This application Apr. 24, 1974, Ser. No. 463,823
Int. Cl.² E04B 1/68, 1/98; E01D 19/06
U.S. Cl. 52—573 11 Claims



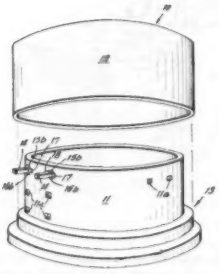
1. An expansion-contraction joint intersection for use between relatively movable members defining an intersecting space therebetween comprising: a first plurality of longitudinally extending transversely spaced, narrow runners disposed on edge in a generally close side-by-side relation and directed in a first direction, at least one additional plurality of longitudinally extending transversely spaced runners disposed in a generally close side-by-side relation and directed in a different direction intersecting said first direction, said first runners having first ends and said additional runners having additional ends meeting said first ends in a generally converging manner, said first ends being substantially uniformly spaced from said additional ends; a plurality of longitudinally extending resilient, compressible, sponge-like pads respectively disposed between adjacent runners and defining a sandwich therewith in which said runners are displaceable transversely toward and away from each other, said pads being spaced from the outer top edge of the associated runners to define shallow longitudinal recesses therewith; therein said first and additional ends of said runners are notched along the outer top edge of associated runners to define generally a shallow square recess; a thin cover member disposed in the recess over said spaced ends of said runners; and a deformable, mastic sealing material disposed within said recesses between adjacent runners in overlying relation with said pads, wherein said pads and mastic material substantially fill the space between adjacent runners and said mastic material being also disposed within said recess in overlying relation with said cover member; said mastic material bonding to the associated runners, underlying pads and cover member forming a seal therewith.

3,974,615

APPARATUS FOR FORMING STEPS IN MANHOLES AND THE LIKE

John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.

Filed Apr. 22, 1974, Ser. No. 462,957
Int. Cl.² E04G 15/04, 5/04
U.S. Cl. 52—698 4 Claims



1. In a mold assembly, core members for use in said assembly to form cast bodies, said mold assembly having inner and outer mold members defining a hollow mold space therebetween, wherein one wall of one of said mold members is provided with rectangular shaped openings which define locations for anchoring rod-like members to said cast body, each core member comprising:
a one-piece elongated hollow molded plastic body of rectangular cross-section having a first open end and a second sealed end, the length of said body being much greater than either width;
first and second pairs of resilient flanges integrally joined to said body adjacent said open end and extending in a direction perpendicular to the longitudinal axis of said body;
said first pair of flanges being substantially coplanar, said second pair of flanges being substantially coplanar and being spaced a predetermined distance inward from said first pair of flanges, said first and second pairs of flanges cooperating to embracing opposite surfaces of the marginal portion of said one mold member and surrounding

said opening to maintaining the core member in proper alignment;

at least one of said pair of flanges being resilient along their lengths in said transverse direction to facilitate continuous bending thereof;

said core members each being inserted into each of said openings from a first side of said wall, whereby, upon insertion, said flexible flanges are adapted to flex to clear the opening and after insertion, snap-free of the associated opening to position said first and second pairs of flanges along opposite surfaces of the opening in the mold wall to retain the core member in position prior to insertion of the casting material and, upon withdrawal of the cast body from the mold, to enable one of the pairs of flanges to snap-free of the wall opening and return to the unflexed position while said core member is retained in the hardened casting material being removed from the mold.

3,974,616

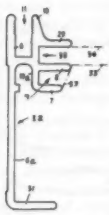
STRUCTURAL COMPONENT FOR FORMING LOAD SUPPORTING FRAMES

Maxwell David Beckley, 20 Laurence Ave., Turramurra, New South Wales, 2074, Australia

Filed Dec. 9, 1974, Ser. No. 531,107

Int. Cl.[2] B65D *7/00*; E04B *1/00*; E04C *3/30*

U.S. Cl. 52—738 1 Claim



1. A structural component for the construction and erection of load supporting frames, said structural component comprising an extruded member of indefinite length comprising a pair of outer limbs formed longitudinally at right angles to one another, a first inner limb formed longitudinally integrally on the inside of one of the outer limbs in spaced relationship from the inside of the other outer limb to form therewith a first longitudinally extending channel, and a second inner limb formed longitudinally integrally on the first inner limb in spaced relationship from the inside of said one outer limb to form therewith a second longitudinally extending channel located at right angles to said first channel, a selected limb of either of the pairs of limbs forming the respective channels projecting outwardly beyond the other limb of said pair, said one outer limb projecting in width beyond said other outer limb to provide an extended outer limb (6*a*) having a flange at its distal end, said flange extending longitudinally inwardly to form a third channel with said other outer limb and an additional limb formed longitudinally on said second inner limb in spaced relationship from said first inner limb to form a fourth channel therewith.

3,974,617

DOUBLE SHELL TANK CONSTRUCTION METHOD

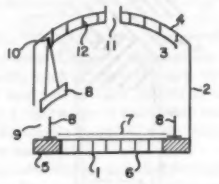
Makoto Tominaga, Tokyo; Yuji Takeuchi, Yokohama; Takanori Kimura, Tokyo; Shinya Nakano; Nobumi Karasuno, both of Yokohama, and Hiroshi Takeuchi, Konosu, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,328

Claims priority, application Japan, Dec. 17, 1973, 48-142271

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—741 7 Claims



1. A double shell tank construction method comprising the steps of assemblying an outer shell bottom plate and outer shell plates to form an outer shell, assemblying an outer roof and an inner roof into a unitary construction within the assembled outer shell, lifting said assembly of said outer and inner roofs and securing the outer roof to the top of said assembled outer shell, forming a ring-shaped inner bottom concrete foundation upon said outer shell bottom plate and then disposing bottom heat insulating members within said ring-shaped foundation, assemblying an inner bottom plate over said ring-shaped foundation and said bottom heat insulating members, and thereafter assemblying within the assembled outer shell, inner shell plates to form an inner shell upon said inner bottom plate.

3,974,618

METHOD OF AND MEANS FOR MULTI-STORY BUILDING CONSTRUCTION

Pablo Ortega Cortina, Taine 229-Despachos 601-602, Mexico City 5, Mexico

Division of Ser. No. 489,030, July 16, 1974. This application Aug. 4, 1975, Ser. No. 601,789

Claims priority, application Mexico, Mar. 18, 1974, 149914

Int. Cl.[2] E04G *21/14*

U.S. Cl. 52—745 5 Claims

1. Apparatus for erecting single or multiple story concrete columnless buildings, said apparatus comprising:

a permanent base for a building to be erected, said base providing a first casting bed;

a first set of load supporting, downwardly swingable wall panels positioned generally horizontally on said first casting bed;

filler material in any voids in or between said wall panels to provide a second casting bed;

a first floor slab positioned generally horizontally on said second casting bed and lying directly above said first set of wall panels;

lift attaching members secured to the periphery of said first floor slab;

a plurality of spaced apart, flexible pick-up cables connected along a pivot line between said wall panels and said floor slab to pivotally connect said wall panels to said floor slab thereby forming an interconnected first set of wall panels and corresponding floor slab;

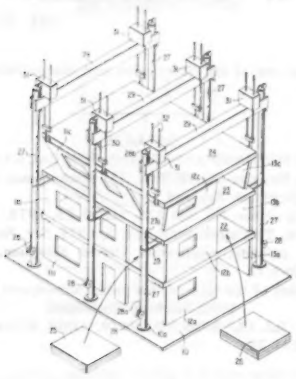
additional sets of wall panels and floor slabs positioned one above the other in layers to provide a stack of said wall panels and floor slabs corresponding to the stories of the

building, each layer utilizing the preceding layer as a casting bed;

lift attaching members secured to each of said additional floor slabs;

pairs of temporary spaced columns positioned exteriorly of said base and adjacent said lift attaching members, said columns being of slightly greater height than the height of the erected building;

a bridge member movably supported between each said pair of columns, each of said bridge members extending over said stack of wall panels and floor slabs and carrying lift means adjacent each column;



lift fixture assemblies attachable to, and extending between, said lift attaching members on said floor slabs and said lift means, and disconnectable from said lift attachings members of each floor once said floor has been erected;

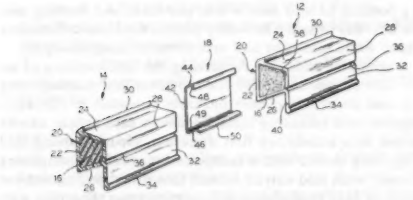
means for actuating said lift means to raise said stack whereby each of the wall panels in said first set of wall panels will swing downwardly on said pick-up cables about said pivot lines to a vertical, load supporting position and further whereby said additional sets of wall panels and floor slabs are sequentially raised by said interconnected lift means, lift fixture assemblies and lift attaching members so that succeeding sets of wall panels swing into position to erect the additional stories of said building whereupon said temporary columns and said bridge members are dismantled and removed.

3,974,619

ALIGNMENT CLIP FOR REGLETS

Norman G. Turner, Lake Bluff, Ill., assignor to Superior Concrete Accessories, Inc., Des Plaines, Ill.

Filed June 26, 1975, Ser. No. 590,626
Int. Cl.[2] E04C *3/30;* **E04D** *1/36*
U.S. Cl. 52—726 **2 Claims**



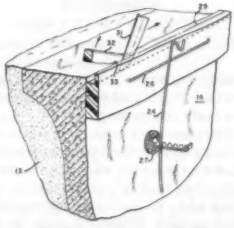
1. An aligned filled reglet assembly which comprises two like and similarly oriented reglets in end-abutting relation, a sealer filling in each of said reglets, and an alignment clip bridging the joint between the adjacent ends of said reglets, each of said reglets comprising a channel component including a bightportion and two flanges extending from opposite longitudinal edges of the bight portion and converging outwardly therefrom, an anchoring rib extending outwardly from one of said flanges of each reglet adjacent the bight portion thereof, an apron bridging the space between the outer ends of and connecting said reglet flanges, and means providing a longitudinal groove in said apron and adjacent to one of said reglet flanges, whereby said apron may be slit along said groove and swung slightly inwardly to permit entry into the channel component of the lip of lip-equipped flashing said clip comprising a body portion adapted to overlie the adjacent ends of the bight portions of said reglets, and flange means on opposite longitudinal edges of said body portion for engaging said reglet flanges to hold said reglets in alignment, said flange means including a hooklike flange on one longitudinal edge of said body portion for attaching the clip to said anchoring ribs, and an undulatory flange on the opposite longitudinal edge of said body portion for snapping the clip on the flange of each reglet opposite to the reglet flange from which said anchoring rib extends.

3,974,620

METHOD UTILIZING A FORM BOARD FOR SECURING A ROW OF TILES IN ALIGNMENT ALONG AN IRREGULAR FACE OF A SWIMMING POOL BOND BEAM

William J. Stegmeier, 1073 Shary Circle, Concord, Calif. 94520

Filed June 26, 1974, Ser. No. 483,222
Int. Cl.[2] E04B *1/35;* **E04G** *21/00*
U.S. Cl. 52—747 **17 Claims**



1. A method of securing a row of tiles or the like to an irregular face of a bond beam during the construction of a swimming pool or the like comprising:

a. providing an elongated form board of a cuttable material having a side face and an upper leveling surface meeting said side face, and having a slit extending lengthwise thereinto from said side face at a location spaced from said leveling surface;

b. positioning said form board with said side face against said irregular face of said bond beam along the location at which said row of tiles is to be secured;

c. providing a surface of said form board defining the alignment desired for said tiles which is generally parallel to said side face and spaced inwardly from said bond beam to provide a cavity along said location at which said row of tiles is to be secured, by removing a section of said form board between said side face and said surface after said form board is positioned with said side face against said irregular face of said bond beam through the steps of:

1. scribing a line on said leveling surface conforming to said contour defining a desired adjacent orientation of alignment for said tiles; and

2. cutting said material along said scribed line generally parallel to said side face between said leveling surface and said slit to form said surface having said contour;

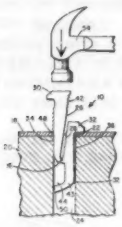
d. filling the cavity between said irregular bond beam face and said surface of said form board providing said alignment desired for said tiles with a cement;
e. allowing said cement within said cavity to set to a self-supporting configuration at said surface of said form board to thereby form an alignment surface for said tile conforming to said form board surface;
f. removing said form board from its position against said bond beam face; and
g. thereafter using said alignment surface as a reference face for securing a row of tiles to said bond beam in the desired adjacent alignment desired in the finished swimming pool.

3,974,621

WEDGE-BOLTED JOINT

Micheal O. Stang, 7757 Greenly Drive, Oakland, Calif. 94605

Filed Mar. 17, 1975, Ser. No. 559,329
Int. Cl.² F16B *5/00*
U.S. Cl. 52—758 F **8 Claims**



1. A fastening device to connect a first body to a second body, the first body having an opening alinged with an opening in the second body comprising:
a. first member having a projection for holding a portion of the first body against the lip of the opening in the second body, said first member having an inclined surface;
b. second member having a projection for holding a portion of the first body to the lip of the opening in the second body, said second member having an inclined surface; said inclinded surfaces of said first and second members facing one another, a portion of said unit, including portions of both members, positioned within the aligned openings such that an impact on said members causes said inclined surfaces to slide upon one another, said first and second members snugly fitting within said aligned openings with said projections firmly holding the first body to the second body, said first and second members detachably connected with a neck between said first and second members to form a unit and said impact causes said first and second members to detach;
c. recess included in said second member to at least partially enclose said neck after detachment of said first and second members.

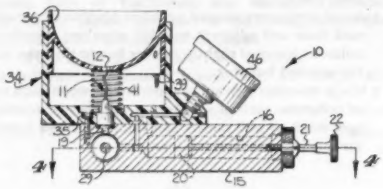
3,974,622

APPARATUS AND METHOD FOR REPRESSURIZING HOLLOW VALVELESS ARTICLES

Fred H. Stubblefield, Jr., 2618 Merrywood Road, Charlotte, N.C. 28210

Filed June 30, 1975, Ser. No. 591,880
Int. Cl.² B65B *31/04*
U.S. Cl. 53—7 **16 Claims**

12. A method of repressurizing hollow valveless balls and the like comprising penetrating a ball to be repressurized with a needle defining a single common passageway while delivering sequentially through the common passageway and into the ball pressurized fluid for repressurizing the ball and sealant for



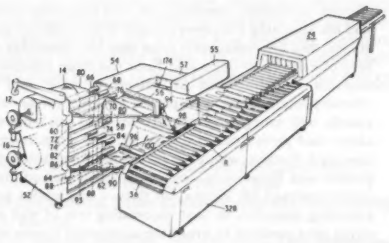
sealing the site of the penetration and then withdrawing the needle.

3,974,623

METHOD AND APPARATUS FOR PACKAGING

Frederick Douglas Clavell Bate, 155 Barkerhouse Road, Nelson, Lancashire, England

Division of Ser. No. 341,526, March 15, 1973, Pat. No. 3,881,296. This application Apr. 8, 1975, Ser. No. 566,624
Claims priority, application United Kingdom, June 29, 1972, 30399/72
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.² B65B *9/02, 9/14, 43/08, 43/34*
U.S. Cl. 53—29 **5 Claims**



1. A method of wrapping a solid article comprising the steps of feeding said article along a translatory path, forming a tube of wrapping material and moving it alongside said translatory path, with at least the end of said tube nearest said article open, providing an inserted expansible tube-opening device in collapsed condition within at least the open end of said tube, moving said tube-opening device along said translatory path with said article, expanding said inserted tube-opening device to open out at least said open end of said tube and grip said tube, displacing said expanded tube-opening device laterally of said path to pull said tube toward the associated article during feeding of said article into the tube, and feeding said article laterally of said translatory path to feed said article into said tube while said tube and article move along said path.

5. A wrapping machine comprising the combination of an article carrier, an expansible and contractible tube-opening device and an article pusher movably mounted in operative association and including means whereby said article carrier is moved in a translatory first direction, means moving said tube opening device with a compound movement comprising movement with said carrier in said first direction, movement laterally of said first direction in a projecting direction with respect to the carrier, movement in a retracting direction opposite said projecting direction and expanding and contracting movement; and means moving said article pusher with a compound movement comprising movement with said car-

rier in said first direction relative to said tube-opening device in said projecting and retracting directions.

3,974,624

APPARATUS FOR DISTRIBUTING ARTICLES INTO RECEPTACLES

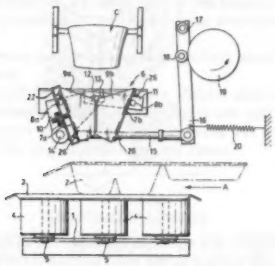
John Richard Bentley, Bristol, and Simon Foley, London, both of England, assignors to Auto Egg (Bristol) Limited, Bristol, England

Filed Aug. 22, 1974, Ser. No. 499,680

Claims priority, application United Kingdom, Aug. 25, 1973, 40381/73; Oct. 24, 1973, 49574/73

Int. Cl.² B65B *35/32*

U.S. Cl. 53—160 **8 Claims**



1. In a packing machine having a horizontally moving conveyor, an apparatus for distributing articles, such as eggs, from the moving conveyor into receptacles comprising: at least one platform disposed below said conveyor for supporting at least one receptacle having multiple compartments for receiving the individual articles from the horizontally moving conveyor; a stationary collator disposed above the platform between the platform and the moving conveyor, the collator comprising a pair of walls, means defining a group of pockets between said collator walls for receiving the individual articles from the conveyor, the pockets being spaced apart in a direction parallel to the direction of movement of the conveyor; means supporting said collator walls for pivotal movement about horizontal parallel pivot axes; a housing supported for pivotal movement about a horizontal axis; means releasably connecting one of said pocket-defining walls to said housing; a release mechanism means connected to the collator to cause relative pivotal separation of the walls to release the individual articles therefrom; and, means controlling the release mechanism to operate the latter automatically when the articles are located in all the pockets of the group thereby, releasing the articles from all of said pockets of the group simultaneously so as to fall from the collator into respective receptacle compartments.

3,974,625

LOADING ARTICLES INTO BAGS

John Ernest Simmons, Ruislip, England, assignor to EMI Limited, Hayes, England

Filed July 18, 1973, Ser. No. 380,206

Claims priority, application United Kingdom, July 29, 1972, 35549/72

Int. Cl.² B65B *43/28*

U.S. Cl. 53—189 **7 Claims**

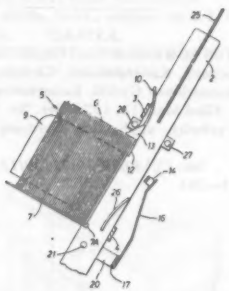
1. A machine for loading gramophone records into bags having open tops comprising;

a base for supporting a stack of bags with their bottoms in contact with the base,

a first projection projecting over the front of the stack at the bottom of the bags to prevent the first bag in the stack from moving off the base,

a second projection for projecting into the mouth of the first bag in the stack so as to retain the back of the bag,

bag moving means pivotted for arcuate movement pulling and lifting the front of the first bag away from the back to open the bag and thereby moving the bottom of the bag past the first projection,



means for delivering a gramophone record to the opened bag at the front of the stack in such a way that the record carries the bag away from the second projection on release from said pivotted means,

means located rearwardly of the second projection over and in proximity to at least the second bag in the stack to tend to prevent the second bag being lifted when the bottom of the first bag is moved past the first projection.

3,974,626

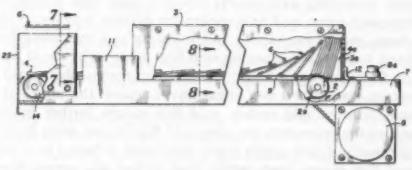
SLIDE CASSETTE PACKER

Edward W. Getsch, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sept. 9, 1975, Ser. No. 611,629

Int. Cl.² B65B *5/10, 35/56*

U.S. Cl. 53—244 **4 Claims**



1. For use with a photographic slide mounting machine which includes a slide delivering mechanism for discharging the mounted slides from said machine; a slide packing mechanism, comprising

a transporting and stacking conveyor having a receiving end and stacking end and constructed and arranged to successively receive at the receiving end the mounted slides from the delivery mechanism of the mounting machine in overlapped "shingled" relationship and transport said overlapped slides toward the stacking end thereof,

an elongated carrier cassette removably mounted on said conveyor and having sides spaced apart a distance greater than the width of the slides to be packed,

a pair of spaced apart inwardly extending flanges provided at the bottom of said cassette sides and disposed below the slides being transported, the space between said flanges being less than the width of the slides but greater than the width of said conveyor to receive and capture said slides within said cassette,

an inclined stacking member at the stacking end of said cassette to shift the overlapped slides being transported

by the conveyor up into substantially vertical position and from a horizontal stack of upstanding slides packed within said cassette, said inwardly extending flanges retaining said slides in said cassette to permit removal of the packed slides from said conveyor and

said conveyor being constructed and arranged to slidably engage the stacked slides during the transporting and stacking of successive slides in the cassette.

3,974,627

APPARATUS FOR INSERTING OBJECTS INTO CARTONS

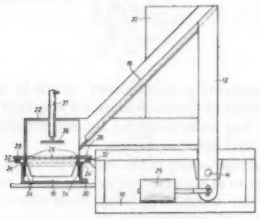
Hans Groschopp, Kaiserslautern, Germany, assignor to Pfaff Industriemaschinen GmbH, Kaiserlautern, Germany

Filed Mar. 18, 1975, Ser. No. 559,522

Claims priority, application Germany, Mar. 28, 1974, 7410824

Int. Cl.² B65B *39/02, 39/12, 5/00*

U.S. Cl. 53—261 8 Claims



1. Apparatus for inserting objects into an open-ended carton having a plurality of upstanding side walls and a bottom wall comprising means defining a filling station, means for locating said carton at said filling station, pivotable flap means adapted to engage said upstanding side walls of said carton from the interior thereof to hold said carton in an upright opened condition during insertion of said object, mounting means including a mounting frame having generally horizontally extending axle means thereon, said flap means being mounted upon said axle means for pivotal movement thereabout, means for raising and lowering said mounting frame, fixed stop means engaging said flap means when said mounting frame is lowered to pivot said flap means about said axle means toward and into engagement against the inside of said side walls of said carton, said flap means further including means for oppositely pivoting said flap means away from said side walls of said carton when said frame is raised to withdraw said flap means from within said carton and means fixed to said mounting frame for conveying said objects into said carton at said filling station.

3,974,628

BANDING MACHINE

Anatole Ethan Konstantin, 10 Live Oak Road, Norwalk, Conn. 06851

Filed Nov. 11, 1975, Ser. No. 630,906

Int. Cl.² B65B *13/16*

U.S. Cl. 53—291 10 Claims

1. In apparatus for placing a band of shrinkable plastic film over an object to be banded, comprising in combination:

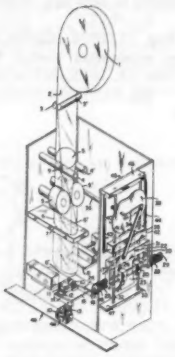
a. means for dispensing shrinkable plastic tubing, flattened in a first plane,

b. means for opening a section of said flattened tubing and for reflattening the opened tubing in a plane perpendicular to said first plane,

c. means for feeding a preselected length of said reflattened tubing into position for being cut,

d. means for cutting said preselected length of reflattened tubing into a band, and

e. the improvement comprising: means for grasping said band and placing it over said object, comprising a plurality of elongated parallel fingers capable of coordinated linear motion in the direction of the longitudinal axis of the fingers and lateral motion, thereby enabling said fingers (1) to contract sufficiently to enter inside the



band before it is cut from the tube, (2) to expand against the inside surface of the band to open it fully and to grasp it before or as the band is cut, (3) to place the expanded band around said object, and thereafter (4) to contract sufficiently to slip out from inside the band, leaving the band positioned around said object.

3,974,629

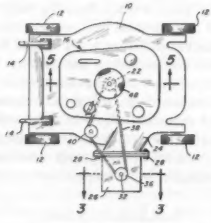
LAWN MOWER WITH IMPROVED MULCHING ATTACHMENT

Lionel E. Russell, Rte. 1, Oologah, Okla. 74053, and David Franklin McNabb, Drawer C, Catoosa, Okla. 74015

Filed June 18, 1975, Ser. No. 587,956

Int. Cl.² A01D *35/264*

U.S. Cl. 56—13.7 6 Claims



1. A lawn mower having means for chopping cut grass, leaves and the like into small sizes, comprising:

a frame having a horizontal deck portion and vertical downwardly extending frame side walls therearound, the side walls having a discharge opening therein, the frame having wheels for moving over the ground and a handle extending therefrom for guiding the mower;

a prime mover supported on the frame horizontal deck portion;

a vertical shaft rotatably supported centrally of the frame, the shaft extending through the frame;

a drive sheave positioned on said vertical shaft between said prime mover and said frame;

a horizontal cutting blade affixed to the shaft below the frame deck portion by which grass is cut and expelled

along with leaves and the like out through said discharge opening;

a chute affixed to said frame communicating with said discharge opening, the chute being outside the rotational area of said horizontal cutting blade, the frame side walls and chute being arranged so that cut grass, leaves and the like are expelled through said chute by the action of said horizontal cutting blade and the chute being defined by horizontal top and bottom walls and vertical side walls providing an enclosed rectangular passageway therethrough;

a vertical auxiliary shaft supported within said chute by bearings affixed to said chute top and bottom walls, the vertical auxiliary shaft extending through an opening in said top wall;

rectangular chopping blades affixed to said auxiliary shaft within said chute, the periphery of the blades conforming in close proximity to said rectangular passageway in said chute;

a driven sheave positioned on said auxiliary shaft above said chute; and

a belt looped around said drive sheave and said driven sheave whereby said chopping blades are rotated by said prime mover to chop into small pieces cut grass, leaves and the like expelled through the chute.

3,974,630

MOWING MACHINE

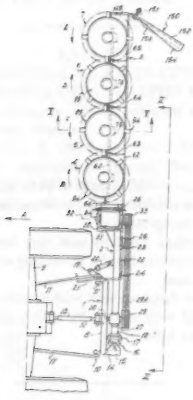
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Apr. 29, 1974, Ser. No. 465,100

Claims priority, application Netherlands, Apr. 27, 1973, 7305887

Int. Cl.² A01D *55/18*

U.S. Cl. 56—295 **11 Claims**



1. A rotary mowing machine comprising a frame with coupling means connectable to a tractor having a power take-off, said frame comprising an elongated hollow beam having support means and said beam extending adjacent the ground and transverse to the direction of travel during operation of the machine, a plurality of upwardly extending shafts extending through said support means and said shafts being arranged side by side, said shafts being drivingly connected to a high speed drive shaft for operative rotation about respective axes, said drive shaft being located within said beam and extending generally parallel to the longitudinal axis of said beam, bearing means secured adjacent the bottom of said beam and the lower portions of said shafts being mounted in said bearing means, a plurality of rotors with cutting elements mounted on said shafts and said rotors being driven by said drive shaft through their respective shafts, the speed of rotation of said cutting elements being at least 3500 r.p.m., each of said rotors having a dish-shaped disc with a convex side facing away from said support means, cutting elements being mounted on said disc and positioned to cut crop material during rotation of said rotors.

3,974,631

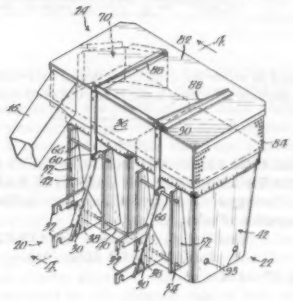
GRASS CATCHER ASSEMBLY

Keith H. Rhodes, Lincoln, Nebr., assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 24, 1975, Ser. No. 543,670

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **9 Claims**



1. A grass catcher assembly comprising, a frame adapted to be attached to a mower; first and second open top containers respectively pivoted about a generally horizontal pivot on said frame; separate releasable latch means between said frame and respective containers for normally maintaining said containers in a generally upright position; a single cover on said frame covering the open tops of all containers, said cover having an inlet opening for receiving grass clippings from the associated mower, said containers being substantially rectangular in cross-section and said cover includes (1) a first portion fixed to said frame, said first portion having said inlet opening and extending along one side of both of said containers, and (2) a second portion pivoted on said frame adjacent first portion, said second portion having a top wall and three side walls, said second portion having a closed position and cooperating with said first portion to define a rectangular enclosure surrounding the containers; and deflector means on said cover in the path of movement of grass clippings through said inlet opening for producing substantially equal distribution of grass clippings to the open tops of said containers.

3,974,632

COLLECTION OF CROP AND LIKE MATERIALS

Cornelis Van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed Aug. 20, 1974, Ser. No. 499,047

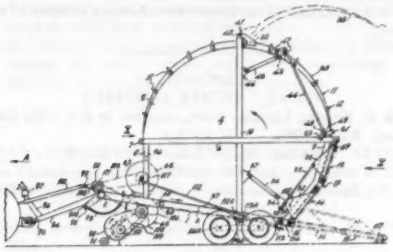
Claims priority, application Netherlands, Aug. 24, 1973, 7311670

Int. Cl.² A01D *87/00*

U.S. Cl. 56—341 **25 Claims**

9. A crop collection vehicle comprising a frame movable over the ground and a crop receiving chamber supported on said frame, a conveyor system positioned at least partly within said chamber to move crop and unload same, said chamber having a floor and further being defined by walls including a front wall and a rear wall, both of which have a substantially curved configuration, said front and rear walls adjoining a top of said chamber, said conveyor system being positioned to roll crops in a mass along the interior surfaces of said walls and top within said chamber during the operation of said conveyor system, said rear wall having a tiltable portion that is displaceably connected to said frame with hinge means and movable

to a downwardly tilted unloading position with respect to said chamber, in which at least one conveyor of said system is



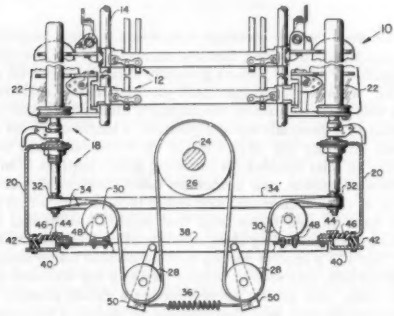
positioned to move the crop mass out of said chamber and said tiltable portion affording a guide for the crop being unloaded.

3,974,633

NOISE ISOLATION MOUNTING MEANS FOR TAPE TENSIONER ASSEMBLY OF A TEXTILE YARN TWISTER

Earl C. Clevenger, Clemson, S.C., assignor to Platt Saco Lowell Corporation, Easley, S.C.

Filed Oct. 6, 1975, Ser. No. 619,827
Int. Cl.² D01H *1/24, 1/16*
U.S. Cl. 57—1 R **9 Claims**



1. In a textile yarn twister machine, having a plurality of spindle assemblies mounted upon rails and in a row therealong on each longitudinal side of said machine, and having drive means for rotationally driving the spindles of said assemblies to form packages of twisted yarn thereon, said drive means comprising a drive motor, a drive shaft from said motor extending longitudinal and intermediate said rows and power transmission interconnections joining said shaft to said assemblies comprising, for a pair of opposing assemblies, a drive drum secured to said shaft for rotation therewith, a plurality of idler pulley wheels intermediate said drum and said assemblies, a continuous drive tape interconnecting said pair of assemblies and entrained on peripheral surfaces of said drum and idlers, and a tape tensioning means to maintain said tape under sufficient tension to transmit power from said drum and through said idlers to said pair of spindle assemblies, the improvement comprising:

resilient mounting means for supportively and resiliently mounting said idlers and tape tensioning means intermediate said pair of opposing spindle assemblies in a stable condition transversely and longitudinally the machine, said mounting means comprising

resilient transverse support means for rigidly supporting said idlers and said tape tensioning means, for resiliently interconnecting said opposing spindle rails, and for resiliently separating said idlers and tape tensioning means from said spindle rails, and

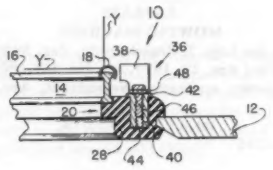
rigid longitudinal support means for rigidly interconnecting a plurality of said resilient transverse support means in a direction longitudinal said machine, and being spaced away from said spindle rails.

3,974,634

RESILIENT MOUNTING MEANS FOR A TRAVELER CLEANER

William S. McCall, Pendleton, and Lester W. Pray, Clemson, both of S.C., assignors to Platt Saco Lowell Corporation, Easley, S.C.

Filed Sept. 12, 1975, Ser. No. 612,938
Int. Cl.² D01H *1/00*
U.S. Cl. 57—57 **12 Claims**



1. In combination with a textile yarn spinning or twisting ring holder and a traveler cleaner, mounting means fixed to said ring holder comprising

a resilient member fixed to said ring holder in the region thereof appropriate for the mounting of said cleaner upon said holder, and

a rigid member fixed to and within said resilient member, being formed with means by which said cleaner may be joined to said holder.

3,974,635

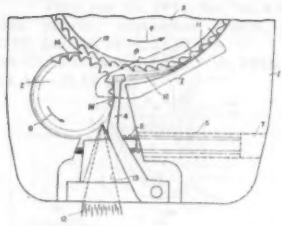
FEED ROLLER FOR FEEDING FIBERS TO A COMBING ROLLER IN AN OPEN END SPINNING MACHINE

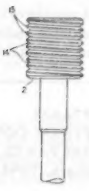
Takashi Morikawa, Amagasaki; Hidetoshi Kihara, Hirakata; Tohru Urifu, Itami, and Hisateru Takahashi, Fukui, all of Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, both of, Japan

Filed July 12, 1974, Ser. No. 488,197
Claims priority, application Japan, Sept. 3, 1973, 48-103681[U]
Int. Cl.² D01H *1/12, 13/02*
U.S. Cl. 57—58.95 **2 Claims**

1. A feed roller for feeding fibers to a combing roller in an open end spinning machine, said feed roller having a plurality of circumferential grooves in the peripheral surface thereof, at

least one longitudinal end of the peripheral surface of the feed roller being ungrooved and the diameter of the ungrooved





portion being the same as the diameter of the portions of the roller between any two adjacent grooves.

3,974,636

BOOSTER CIRCUIT FOR A LIQUID CRYSTAL DISPLAY DEVICE OF A TIMEPIECE

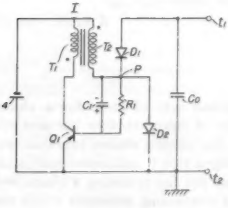
Masaaki Kamiya, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 1, 1974, Ser. No. 520,352

Claims priority, application Japan, Nov. 8, 1973, 48-129356[U]; Dec. 26, 1973, 49-5348[U]

Int. Cl.² G04C *3/00*; H03F *1/40*

U.S. Cl. 58—23 R **3 Claims**



1. A booster circuit for a liquid crystal display device of a timepiece comprizing, a direct current source, a blocking oscillator having a transformer of which the turns rato is 1 : *n* (where *n* is a real number), and a rectifier circuit for rectifying the oscillator output voltage; wherein the secondary winding of said transformer is connected between the output of said blocking oscillator and said source to superpose the blocking oscillator output voltage on the voltage of said direct current source.

3,974,637

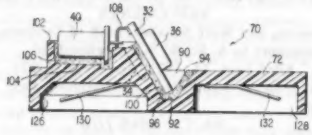
LIGHT EMITTING DIODE WRISTWATCH WITH ANGULAR DISPLAY

John M. Bergey; Robert E. McCullough, and Arthur H. O'Connor, all of Lancaster, Pa., assignors to Time Computer, Inc., Lancaster, Pa.

Filed Mar. 28, 1975, Ser. No. 563,105

Int. Cl.² G04C *3/00*

U.S. Cl. 58—50 R **14 Claims**



1. A wrist watch comprising a watch case having a flat back plate and bezel, said bezel having a viewing window with a central axis intersecting the plane of said back plate at an acute angle, a plurality of light emitting diode digital display elements and a photosensor within said case adjacent said window, means coupled to said photosensor for controlling the electrical energy supplied to said display elements in response to the amount of ambient light passing through said window and impinging on said photosensor, said display elements being mounted on an electrically insulating substrate, a large scale integrated circuit on said substrate and electrically coupled to said display element, said large scale integrated circuit being mounted on the opposite side of said substrate from said display elements, and a module frame inside said case supporting said substrate, said module frame having a substantially V-shaped groove with long and short sides, said substrate being supported by the long side of said groove.

3,974,638

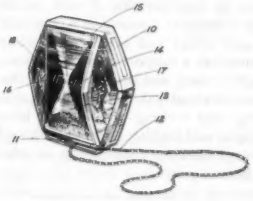
HOURGLASS WATCH

Terry M. Haber, 3050 S. Bristol No. 8C, Santa Ana, Calif. 92707

Filed Sept. 4, 1975, Ser. No. 610,187

Int. Cl.² G04B *19/30, 37/08*; G04F *1/06*; H01H *35/02*

U.S. Cl. 58—50 R **6 Claims**



1. An hourglass watch including, in combination:

a. a watch casing incorporating battery means and defining a shallow cavity in its top exterior surface;

b. display means in said cavity for providing a digital indication of the time;

c. illuminating means in said casing for rendering visible said display means when actuated;

d. a closed chamber of hourglass configuration disposed in said cavity and incorporating electrically conducting granules; and,

e. electrodes connected to said battery means and to said illuminating means to actuate said illuminating means when electrically bridged, said electrodes being in opposed relationship in the constricted central portion of said hourglass in positions to be electrically bridged to-

gether by the flow of said granules under gravity from one portion of the closed chamber to the other portion, whereby said illuminating means may be actuated by holding said watch casing in a position to cause the granules to flow past said constricted portion of the hourglass under the influence of gravity.

3,974,639

DRIVING DEVICE FOR MECHANICAL TIMEPIECE MOVEMENTS

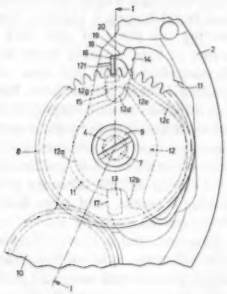
Beat Gilomen, and Kurt Schaller, both of Lengnau, Switzerland, assignors to A. Schild S.A., Switzerland

Filed Sept. 23, 1975, Ser. No. 615,921

Claims priority, application Switzerland, Oct. 9, 1974, 13574/74

Int. Cl.² G04B *1/16*

U.S. Cl. 58—86 **6 Claims**



1. A driving device for mechanical timepiece movements, said device comprising a barrel-drum, a barrel-bridge, an arbor coaxial with said drum and pivoting in said bridge, a toothed ratchet-wheel secured to said arbor and disposed adjacent to said bridge, and a one-piece click comprising a rigid portion rotatable about said arbor between a locking position and an unlocking position, a resilient arm, and a beak disposed at a free end of said arm, said beak being adapted for engagement in said toothing of said ratchet-wheel, wherein said bridge comprises a recess in which said click is disposed between said bridge and said ratchet-wheel, and said click further comprises a support element disposed at said free end of said resilient arm and situated within the peripheral limits of said ratchet-wheel, said recess having sides comprising, for determining said locking position, at least a first banking cooperating in said locking position with said support element and a second banking cooperating in said locking position with said beak.

3,974,640

COUPLING LINK

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

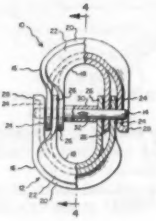
Continuation-in-part of Ser. No. 591,946, June 30, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 641,902

Int. Cl.² F16G *15/04*

U.S. Cl. 59—85 **14 Claims**

1. A coupling link comprising two substantially U-shaped assembly units each having bowed intermediate portions extending into generally parallel leg portions apertured in transversely aligned relation, and a mutually connecting pin slide-fitted through said apertured leg portions thereby providing a complete coupling link comprising two half-link portions hingedly interconnected;

said assembly units each comprising a laminate of two or more members formed of strap-like material, including an inner member and an outer member shaped to interfit to provide the aforesaid assembly units,



the bowed portions of said members of each of said assembly units being shape-yieldable under stress and of generally interfitting U-shaped sectional configurations.

3,974,641

SERIES OF MATCHED SETS OF COMPATIBLE CHAIN-SYSTEM PARTS

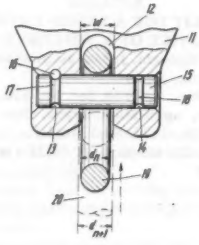
Werner Rieger, Haus Haselbach, 7084 Unterkochen, Wurttemberg, Germany

Filed June 19, 1974, Ser. No. 480,601

Claims priority, application Germany, July 6, 1973, 2335131

Int. Cl.² F16G *15/06*

U.S. Cl. 59—93 **2 Claims**



1. A series of matched sets of parts for a chain system comprising chain links of round-section bar and attachable connecting members for joining chains together, each connecting member having a slot to accommodate a chain link and a lockable retainer pin for retaining a chain link in said slot, wherein links and connecting members which are incompatible in strength cannot be joined together, the bar-diameters of said chain links, the widths of the slots in the connecting members, the internal widths of the links and the diameters of the retaining pins vary stepwise from size to size from one matched set to the next in the series in that the diameters of said retainer pins are each approximately 1.2 times the bar-diameters of the compatible chain links, and the bar-diameters and the internal widths of said links increase by approximately 25% from one size link to the next larger size in the series of matched sets whereby only links and connecting members compatible in strength can be joined together.

3,974,642

HYBRID CYCLE POWER PLANT WITH HEAT ACCUMULATOR FOR STORING HEAT EXCHANGE FLUID TRANSFERRING HEAT BETWEEN CYCLES

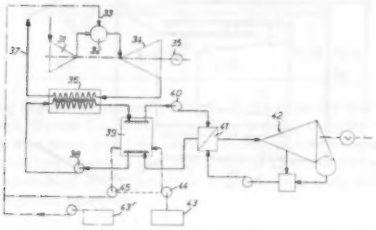
Pierre Henri Pacault, Ville D—Avray, France, assignor to Fives-Cail Babcock Societe Anonyme, Paris, France

Filed Jan. 18, 1974, Ser. No. 434,679

Claims priority, application France, Jan. 26, 1973, 73.02792; Jan. 26, 1973, 73.02793

Int. Cl.[2] F02G *3/00*; **F02C** *3/10*; **F01K** *23/04*, *3/02*

U.S. Cl. 60—39.18 B **16 Claims**



1. A motive-power-producing installation, comprising a gas turbine with an exhaust outlet, a heat accumulator adapted to store heat and including an upper-region inlet and a lower-region outlet, means including a heat-exchanger connected to said turbine-exhaust outlet for transferring heat from turbine-exhaust gases to said heat accumulator and increasing the heat content thereof, said transferring means comprising a series-connected fluid-flow circuit from said lower-region outlet to said upper-region inlet via said heat-exchanger, a vapor generator with a vapor turbine operatively connected thereto, and selectively operable fluid-flow means independent of said transferring means and connecting said accumulator and vapor generator for selectively withdrawing heat from the heat accumulator and supplying it to said vapor generator, whereby said vapor generator may be selectively operated independently of the input of heat to said accumulator.

3,974,643

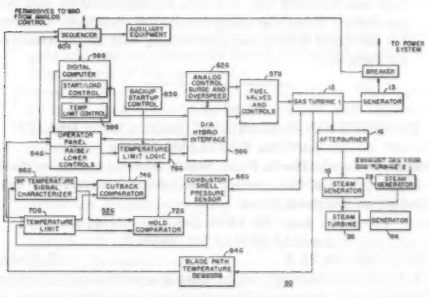
COMBINED CYCLE ELECTRIC POWER PLANT AND A GAS TURBINE HAVING IMPROVED OUTLET TEMPERATURE LIMIT CONTROL

Jack R. Smith, Pittsburgh, and Terry J. Reed, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,694

Int. Cl.[2] F02C *7/02*

U.S. Cl. 60—39.18 B **23 Claims**



1. A combined cycle electric power plant comprising at least one gas turbine, means for generating steam in response to heat energy from said gas turbine, a steam turbine driven by steam supplied to it from said steam generating means, means for generating electric power under the driving power of said turbines, means for controlling the operation of said turbines and said steam generating means, said controlling means including a gas turbine control system having an automatic control and a backup control, said gas turbine control system including means for controlling the flow of fuel to said gas turbine under automatic and backup control, said automatic control means including means for limiting the flow of fuel to limit the outlet gas temperature to a reference value during the automatic mode of operation, means for transferring between said automatic and backup controls under predetermined conditions, said backup control including means for manually raising and lowering a fuel demand signal applied to said fuel control means at least to control gas turbine load during the load mode of operation, and means for overriding the backup control when necessary to control said fuel controlling means at least to prevent fuel flow increases and thereby to limit the turbine outlet gas temperature to a reference value during the backup mode of operation.

3,974,644

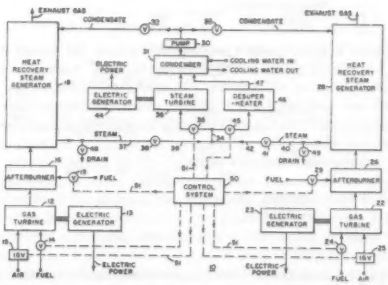
COMBINED CYCLE ELECTRIC POWER PLANT AND HEAT RECOVERY STEAM GENERATOR HAVING IMPROVED MULTI-LOOP TEMPERATURE CONTROL OF THE STEAM GENERATED

Lyle F. Martz, Verona, Pa., and Richard J. Plotnick, Cherry Hill, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,736

Int. Cl.[2] F02C *7/34*, *7/02*

U.S. Cl. 60—39.18 B **23 Claims**



1. A combined cycle electric power plant comprising:

a. at least one gas turbine including an exit through which heated exhaust gases pass;

b. means for generating steam coupled to said gas turbine exit for transferring heat from the exhaust gases to a fluid passing through said steam generating means;

c. a steam turbine coupled to said steam generating means and driven by the steam supplied thereby;

d. means for generating electric power by the driving power of said turbines;

e. an afterburner for supplying additional heat to the exhaust gases passing from said gas turbine to said steam generating means;

f. valve means for controlling the flow of fuel to said afterburner;

g. condenser means for receiving and converting the spent steam from said steam turbine into condensate;

h. means for controlling the operation of said turbines and said steam generating means;

i. said steam generating means including a heat exchange tube wherein the condensate flow derived from said condenser is heated by the exhaust gases from said gas turbine and having an inlet and outlet, a fluid conduit disposed between said inlet and outlet bypassing fluid about said heat exchange tube, and a bypass valve for setting the bypass flow about said heat exchange tube, the bypass

fluid and the fluid heated by said heat exchange tube being combined to be directed to said steam turbine; and

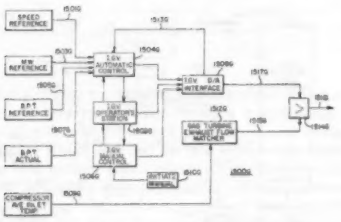
j. said controlling means comprising a first control means responsive to the temperature of the superheated steam directed to said steam turbine for controlling the position of said bypass valve, said first control means including first means for setting a first setpoint according to the desired value of temperature for the superheated steam passed to said steam turbine, with which said control means compares the superheated steam temperature to effect control of said bypass valve, and second control means responsive to the temperature of the superheated steam for controlling the position of said afterburner valve means, said second control means including means for setting a second setpoint higher than the first-mentioned setpoint, with which said second control means compares the superheated steam temperature to effect control of said afterburner valve means.

3,974,645

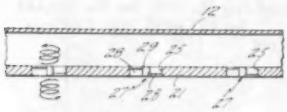
CONTROL APPARATUS FOR MATCHING THE EXHAUST FLOW OF A GAS TURBINE EMPLOYED IN A COMBINED CYCLE ELECTRIC POWER GENERATING PLANT TO THE REQUIREMENTS OF A STEAM GENERATOR ALSO EMPLOYED THEREIN

Jack R. Smith, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,731
Int. Cl.² F02C *9/14*
U.S. Cl. 60—39.29 **15 Claims**



liner, said plurality of rows of axially spaced openings extending for a substantial length of the chamber, said openings having an oscillatory flow through them when combustion instability occurs, said wall having a backing chamber formed therearound including a solid wall which extends for the length of the plurality of openings, each opening of said wall



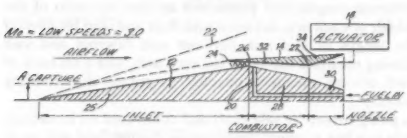
being aligned substantially radially to the chamber and having means therein for swirling gas flow passing therethrough in both directions about the center of said opening between said combustion chamber and said backing chamber to increase the amount of energy absorbed as gas flows in both directions through the openings.

3,974,648

VARIABLE GEOMETRY RAMJET ENGINE

Charles Edward Kepler, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 19, 1968, Ser. No. 753,789
Int. Cl.² F02K 7/08
U.S. Cl. 60—204 **3 Claims**



3. In a ramjet engine including a centerbody, a cowl and a plurality of supports connecting the cowl and the centerbody, the method of providing a variable geometry flow path with a single basic movable component comprising the steps of:

providing the centerbody with a divergent inlet section, a substantially truncated conical convergent mid-section and a substantially truncated conical convergent aft-section having a steeper taper than the mid-section;

providing the cowl inner surface with a first annular convergent wall and an outwardly flaring divergent annular wall downstream of the first wall;

positioning the cowl around the centerbody on the supports so that a portion of first annular cowl wall opposes a portion of the divergent section of the centerbody to define an annular compressor section, and so that the remainder of the first annular wall of the cowl opposes a part of the convergent mid-section of the centerbody to define an annular diverging combustor passage and with the divergent annular wall of the cowl forming with the centerbody an annular diverging nozzle passage of greater divergence; and

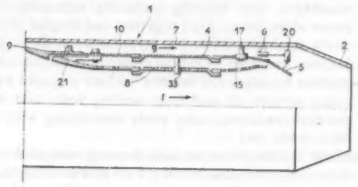
translating one with respect to the other so that the cowl is essentially moved forward with respect to the centerbody with increasing Mach number thereby increasing the airflow capture area, decreasing the inlet throat area, decreasing the combustor exit area and increasing the nozzle area ration.

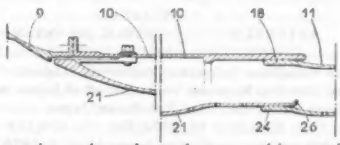
3,974,649

THERMAL RESPONSIVE NOISE SUPPRESSOR FOR EXHAUST DUCT

Andre Alphonse Mederic Leon Camboulives, Savigny-sur-Orge; Theophile Francois le Maout, Cesson; Jacques Serge Rejzner, and Roger Alfred Jules Vandenbroucke, both of Antony, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Nov. 26, 1974, Ser. No. 527,497
Claims priority, application France, Dec. 3, 1973, 73.42947
Int. Cl.² F02K 1/00; F01N 7/00
U.S. Cl. 60—271 **7 Claims**





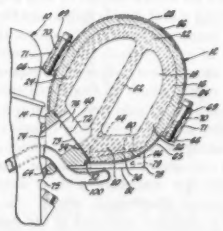
1. A thrust jet engine exhaust duct comprising a tubular support element, at least three annular lining sections disposed successively and coaxially within and radially spaced from said support element, means for connecting the first lining section rigidly to said support element at a first location in said duct, first connector means for connecting the last lining section rigidly to the support element downstream of said first lining section, second connector means for connecting the ends of the at least one remaining lining section to the adjacent ends of the successive lining sections to permit axial displacement and radial deformation of the lining sections so connected, and third connector means connecting said at least one remaining lining section to said support element to permit radial displacement of said at least one remaining lining section with respect to said support element.

3,974,650

EXHAUST REACTOR MANIFOLD

Harry R. Mitchell, Bloomfield Hills; Hal H. Rice, and James R. Abel, both of Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1975, Ser. No. 613,474
Int. Cl.² F01N 3/10
U.S. Cl. 60—282 **5 Claims**



1. An exhaust reactor manifold for an internal combustion engine, said manifold comprising

a liner formed of hardened insulative ceramic and having end walls connected by longitudinal walls to define internally an elongated reaction chamber, said longitudinal walls including a sealing wall having a flat outer surface, a loading wall of dome shaped cross-section extending generally opposite said sealing wall, and opposed side walls interconnecting said loading and sealing walls, said sealing wall having a plurality of gas inlet ports through said flat outer surface and connecting with said reaction chamber,

a layer of compressible heat resistant insulation covering said end and longitudinal walls but leaving exposed the flat outer surface of said sealing wall,

a supporting and retaining housing enclosing said liner and insulation, said housing including separable base and cover elements secured together and shaped to compressively retain the insulation layer between the walls of said housing and liner, said base element including a mounting portion having a flat interior surface engaged by the flat outer surface of said liner sealing wall, said mounting portion containing inlet ports connecting with the liner inlet ports, and

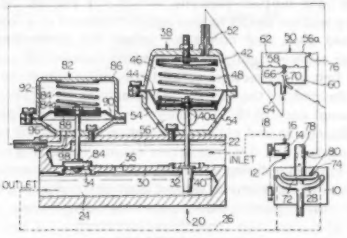
resilient means between said housing and said insulation layer adjacent said loading wall and loading the curved outer surface of said wall to urge said liner into positive sealing engagement of said sealing wall with the flat interior surface of said housing mounting portion.

3,974,651

AFTERBURNING CONTROL OF INTERNAL COMBUSTION ENGINE EXHAUST GAS

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, Yokohama, and Shin-Ichi Nagumo, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 15, 1974, Ser. No. 470,313
Claims priority, application Japan, May 19, 1973, 48-55889
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—290 **3 Claims**



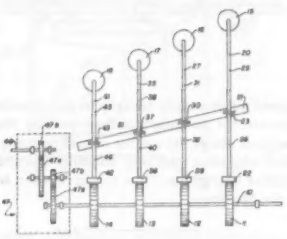
1. An improvement in an internal combustion engine including a secondary air pump, an air intake system, a carburetor having a venturi and an exhaust passageway to receive secondary air, the improvement comprisng control means operatively connected between said pump and said exhaust passageway and operative to change the quantity of said secondary air to said exhaust passageway in response to vacuum variations in the air intake system of said engine, said control means comprising a first diaphragm assembly including a first diaphragm, a vacuum chamber communicating with said air intake system of said engine, and an atmospheric chamber opened to the atmosphere, a first valve mounted between said secondary air supply pump and said exhaust passageway, the first valve connected to said first diaphragm of said first diaphragm assembly to control the flow of said secondary air into said exhaust passageway in response to vacuum created at the venturi of the carburetor of said engine, and in parallel with said first diaphragm assembly a third diaphragm assembly including a second diaphragm, which comprises a vacuum chamber, and a chamber disposed in the opposite position to said vacuum chamber of said third diaphragm assembly and communicating with an intake manifold of said engine, and a second valve connected to said second diaphragm for the third diaphragm assembly to operatively control said second valve to open for said secondary air to enter said exhaust passageway of said engine in accordance with the extent of reduction of said vacuum in said intake manifold at a period of acceleration of said engine.

3,974,652

DEVICE FOR CONVERTING WAVE ENERGY IN BODIES OF WATER

August Otto Lovmark, 8710 Cypress Ave., Cotati, Calif. 94928

Filed July 16, 1975, Ser. No. 596,442
Int. Cl.[2] F03G *7/00, 7/08*
U.S. Cl. 60—398 **5 Claims**



1. A device to convert the motion of waves in a body of water to other forms of energy comprising:

A. a shaft adapted to rotate and having fixed thereto a plurality of unidirectional rotating means;

B. a plurality of floats equal in number to said plurality of rotating means with each float connected by an arm to a fulcrum and having on the other side of said arm from said float a driving means for said unidirectional rotating means, with the arms connected to said floats being of different lengths and positioned so that the ratio of the length of each arm between said float and said fulcrum to the length of said arm between said fulcrum and said driving means is the same for each arm, and with each of said driving means connected to rotate one rotating means;

C. a pump driven by said shaft and connected on its suction side to a low pressure reservoir for driving fluid and on its discharge side to a pressure fluid reservoir; and

D. A fluid-carrying line connecting said high pressure fluid reservoir to a flow control valve which distributes fluid to a fluid-driven motor and diverts excess driving fluid to said low pressure reservoir.

3,974,653

THERMODYNAMIC MOTOR WITH CONSTANT ROTATING POWER SHAFT DRIVEN BY POWER SOURCES WITH INCONSISTENT CYCLES POWERED BY A TEMPERATURE DIFFERENTIAL CAUSED BY THE EVAPORATION OF WATER

Charles Berry Lefkoff, P.O. Box 80923, Chamblee, Ga. 30341

Filed Jan. 22, 1975, Ser. No. 542,922
Int. Cl.[2] F03G *7/04;* **F01K** *25/04*
U.S. Cl. 60—716 **2 Claims**

1. An apparatus which provides usable energy comprising:

a. At least two devices that each move in a cycle such that the movement of each device is naturally independent of the other;

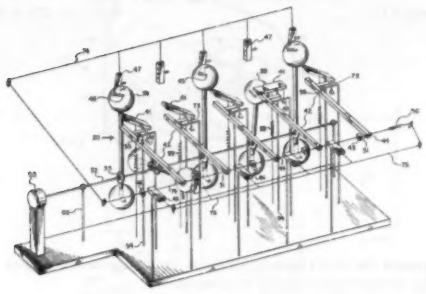
b. means of effecting, before all devices have completed their cycles, that at least one device will begin its cycle comprising:

an arresting member that can be placed in at least two conditions, one of which, the hold condition, prevents at least one device from moving past an arresting position, past which the device begins its cycle, and the other condition of which, the release condition, allows at least one device to move past the arresting position,

a first activating member which, when activated by the movement of a device puts the arresting member in the hold condition such that a device moves to the arrest-

ing position before all devices have completed their cycles, and

a second activating member which, when activated by the movement of a device, puts the arresting member in the



release condition while at least one device is in the arresting position and before all devices have completed their cycles; and

c. means of converting the movement of the devices into usable energy.

3,974,654

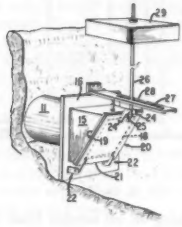
SELF-REGULATING TIDE GATE

Matthew Mirto, Jr., Stratford, Conn., assignor to W. S. Rockwell Company, Fairfield, Conn.

Filed Oct. 28, 1975, Ser. No. 625,861

Int. Cl.² E02B 7/40

U.S. Cl. 61—17 **12 Claims**



1. A device for controlling the flow of water from a conduit open end into a wet marshland or the like and comprising a flow-controlling gate pivotally mounted at its bottom edge upon a horizontal axis in the vicinity of the bottom of the conduit open end, said gate being pivotable upwardly against the conduit opening to a closed position, a bracket extending from above the conduit and having a slot substantially parallel to the longitudinal axis of the conduit, a rod pivotally connected to said gate and extending upwardly through said bracket slot, and a float on said rod above said bracket such that as the level of water adjacent the conduit open end and outside thereof rises, the float will rise to pivot said gate upwardly toward its closed position.

3,974,655

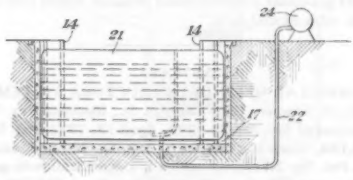
WATER GATE

Richard L. Halpern, 3024 NE. 21st St., Fort Lauderdale, Fla. 33305, and Carl L. Skiles, 6321 SW. 5th Place, Plantation, Fla. 33317

Filed Apr. 14, 1975, Ser. No. 567,760

Int. Cl.² E02B 7/04

U.S. Cl. 61—30 **3 Claims**



1. Means for retaining pollution in a polluted dominant body of water connected by a waterway to an unpolluted subsidiary body of water and to permit vessels to pass from the dominant to the subsidiary body and from the subsidiary to the dominant body with containment of pollution in the dominant body during such passages, comprising, in combination,

a pair of gates disposed sequentially in the connecting waterway, comprising in each gate

a pair of vertically disposed recesses in parallel relationship on either side of the said waterway, connected

by a horizontally disposed bottom recess, adapted to receive and contain in a collapsed condition a collapsible barrier,

buoyant means to elevate the barrier to prevent the flow of water through the waterway,

gravity means to lower the barrier to a collapsed condition, and means to add fluid to and withdraw fluid from the buoyant means,

said containment being effected during the passage of the vessel by closing the barrier first traversed in said passage before opening the barrier next to be traversed.

3,974,656

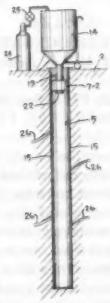
METHOD AND APPARATUS FOR EXCLUDING WATER OR OTHER MATERIAL FROM A BLAST HOLE IN ROCK

Donald F. Kenly, P.O. Box 174, Bearsville, N.Y. 12409

Filed Feb. 21, 1975, Ser. No. 551,737

Int. Cl.² E02D 19/18; E42D 1/00

U.S. Cl. 61—35 **12 Claims**



1. A method for excluding water or other material from a blast hole in rock for an extended period of time, for example to permit subsequent loading of blasting agents which might otherwise be degraded by the presence of water,

comprising the steps of

inserting an expandable sleeve means into the hole, said sleeve means being closed at the lower end inserted into the hole;

thereafter sealing the upper end of the sleeve by exerting outwardly directed pressure from inside said sleeve towards the wall of the hole to seal the upper end of the sleeve inside and against the wall, and forcing compressed gas to pass through said seal into said sleeve and retaining said gas under predetermined pressure within said sleeve, the sides of said hole.

3,974,657

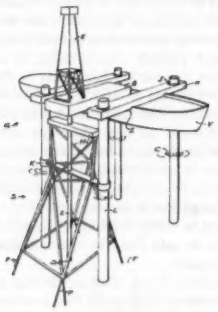
MODULAR OFFSHORE STRUCTURE SYSTEM

Maurice N. Sumner, 1718 Lubbock St., Houston, Tex. 77007

Division of Ser. No. 243,790, April 13, 1972, Pat. No. 3,874,180, which is a division of Ser. No. 107,288, Jan. 18, 1971, Pat. No. 3,716,993, which is a continuation-in-part of Ser. No. 649,889, June 29, 1967, Pat. No. 3,575,005. This application Jan. 8, 1975, Ser. No. 539,300

Int. Cl.² E02D *27/38*

U.S. Cl. 61—50 **3 Claims**



1. An offshore marine structure for receiving and holding a tank comprising a toroidal tubular footing member having therethrough a plurality of pile guides and holding sleeves means for guiding and holding a piling, and a piling, said piling being secured in said sleeve and being driven into the marine floor in downwardly divergent bipodal array and said tubular footing being adapted to receive and hold a tank means.

3,974,658

CONTACT REFRIGERATION UNIT

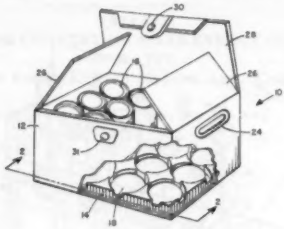
Richard F. Starrett, 21 Upper Ardmore, Larkspur, Calif. 94939

Filed Aug. 20, 1975, Ser. No. 605,977

Int. Cl.² B65B *63/08*; F25D *3/08*

U.S. Cl. 62—60 **18 Claims**

13. A contact refrigeration method for maintaining the temperature of substantially cylindrical beverage containers in a portable unit at a desired constant temperature for a relatively long period of time, comprising the steps of isolating a plurality of cylindrical beverage containers within an insulated environment, contacting at least one layer of said substantially cylindrical beverage containers with a refrigeration unit having correspondingly curved heat conducting surfaces which are contoured to provide intimate surface contact with said beverage containers, the degree of contact between said refrigeration unit and said beverage containers being such that at least 10 to 30% of the outer surface of said beverage containers is in heat exchange contact with said refrigeration unit, said refrigeration unit being substantially filled with a gel refrigerant substance at a temperature below its fusion temperature, and holding said beverage containers in isolation with said refrigeration unit for a period of time sufficient to



permit the latent heat of fusion of the refrigerant substance to be substantially entirely consumed.

3,974,659

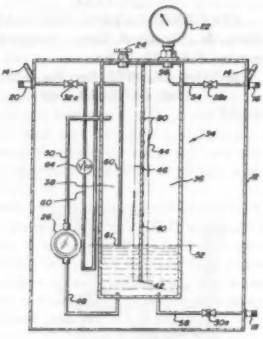
OIL SAMPLING AND CHARGING METHOD AND APPARATUS FOR REFRIGERATION SYSTEMS

Murel C. Edwards, 4208 Shore Drive, Lorain, Ohio 44052

Filed Apr. 16, 1975, Ser. No. 568,715

Int. Cl.² F25B *43/02*, *47/00*

U.S. Cl. 62—84 **10 Claims**



6. A method of taking an oil sample from the refrigerant flowing in a refrigeration unit of the type including a compressor, a condenser, and an evaporator, comprising the steps of:

providing a closed chamber capable of withstanding the discharge pressure from said compressor, said chamber having a baffle member therein;

conducting oil laden refrigerant fluid from said unit and supplying it to the upper end of said chamber and impinging it against said baffle to cause the oil to separate from said refrigerant fluid;

collecting said oil in the bottom of said chamber;

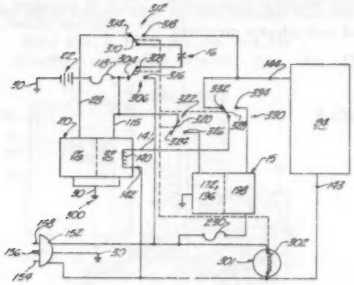
extracting the refrigerant fluid from said chamber at a point below the point at which it is impinged against said baffle and on the opposite side of said baffle, and conducting the refrigerant fluid to said refrigeration unit and introducing it back into said unit at a point therein where there is a pressure differential with the point at which said refrigerant fluid was conducted from said unit to said chamber; and,

continuing the above steps until the quantity of oil within said chamber reached a predetermined level.

3,974,660
POWER SUPPLY FOR REFRIGERATION UNITS

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed July 1, 1974, Ser. No. 485,028
Int. Cl.² H02J 7/00; H02M 7/00
U.S. Cl. 62—229 32 Claims



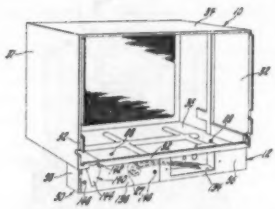
1. In a refrigeration system, the combination comprising a refrigeration unit having a refrigerated enclosure and a compressor driven by an AC motor, a battery, inverter circuit means responsive to connection to said battery to supply first AC power to said motor, connection means for connection to a source of second AC power, first switch means operatively connected to said AC power connection means, said inverter circuit means and said motor, said first switch means having a first switch position for connecting said compressor motor to said inverter circuit means and a second switch position for connecting said compressor motor to said AC power connection means, battery charging means electrically connected to said AC power connection means and adapted to be responsive to said second AC power to provide a series of pulses for charging said battery, second switch means operable in unison with said first switch means and having third and fourth switch positions corresponding to said first and second switch positions of said first switch means, said third switch position of said second switch means being arranged to connect said battery to said inverter circuit means to enable said inverter circuit means, said fourth switch position being arranged to connect said battery to said battery charging means to enable said battery charging means according to the charge on said battery, and third switch means responsive to a predetermined condition of said refrigeration unit to remove power from said compressor motor regardless of the switch positions of said first and second switch means.

3,974,661
SUBBASE FOR ROOM AIR CONDITIONER WALL SLEEVE

Donald C. Ferdelman, and John H. Loos, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 570,001
Int. Cl.² F25D 23/12
U.S. Cl. 62—262 3 Claims

1. An electrical subbase support casing for mounting the room-side end of an air conditioner wall sleeve upon a surface, said casing including an elongated box-shaped shell coextensive with the sleeve width formed from a one-piece blank of sheet metal comprising a rectangular base having upstanding end panels, a rear panel and a front panel; an L-shaped partition supported in said casing having a first wall extending from one end panel in intermediate parallel relation to said front and rear panels, said L-shaped partition having a second transverse wall extending forwardly from said first wall for attachment to said front panel, said L-shaped partition dividing said shell into a receptacle enclosure and a field wiring enclosure, said first wall having one-half of an electrical receptacle fixed thereto whereby a power cord plug from the control box of an air conditioner chassis is adapted to be connected with said receptacle, said front panel having side-by-side access openings separated by a portion of said front panel attached to the free end of said second wall, each said access openings closed

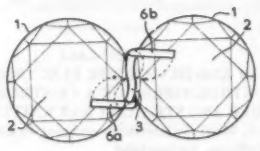


by access cover plates, said receptacle enclosure access cover including a self-contained outwardly formed shield integral therewith, said shield adapted to extend above the base wall of the sleeve to define with a front flange thereof an opening for passage of the power cord therethrough, whereby upon securing on the sleeve the air conditioner room-side front assembly by screw fasteners said power cord is enclosed in accordance with electrical code standards.

3,974,662
ANNULUS OF JOINED SETTINGS WITH FILIFORM CLAW ELEMENTS

Sérop Avédissian, 6, rue de la Grange Bateliere, Paris 90, Seine, France

Filed Jan. 17, 1974, Ser. No. 434,050
Int. Cl.² A44C 9/00, 17/02
U.S. Cl. 63—15 13 Claims



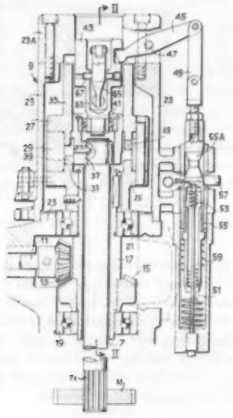
1. A ring shaped article of jewelry, comprising:
a body having an assembly of settings supporting stones set therein;
said settings arranged side-by-side and having fixed junctions; and
a stone-retainer for each junction comprising:
a generally omegoid loop having extremities secured in the junction and a loop portion projecting radially outwardly from the junction;
filiform claw elements each having one end portion secured to one of the settings adjacent to the junction and an opposite end portion protectively engaged within said loop portion; and
intermediate portions of the claw elements entwined around adjacent parts of the loop portion and retainingly engaging the stones;
each setting having two said claw elements secured thereto, said two claw elements each being entwined with the loop portion of a different said loop.

3,974,663

DRIVE UNIT IN CIRCULAR HOSIERY MACHINES FOR A DIAL WITH PLATE SHIFT CLUTCH

Fernando Vinci, Florence, and Dino Morandi, Scandicci, both of Italy, assignors to Filli S.p.A., Florence, Italy

Filed Aug. 6, 1974, Ser. No. 495,148
Claims priority, application Italy, Aug. 7, 1973, 9581/73
Int. Cl.² D04B 15/02
U.S. Cl. 66—26 5 Claims



1. An arrangement in a circular machine for stockings and the like comprising, on combination, a needle cylinder, dial means, a motion drive device between said cylinder and said dial means, a clutch to couple and disengage two members of said drive between said cylinder and said dial means, control means of said clutch to interrupt the rotational motion of said dial means at a predetermined instant, and to provide an engagement in at least one predetermined relative angular position and independent control means for obtaining a disengagement position independent of said first-mentioned control means for obtaining the two couplings.

3,974,664

METHOD AND DEVICE FOR ELECTRONIC SCANNING OF CONTROL-FIELDS OF A CONTROL MEMBER ON CYLINDER AND STRAIGHT BAR KNITTING MACHINES

Ernst Erb, Muri, Switzerland, assignor to Erba Maschinenbau AG, Aefligen, Switzerland

Filed Mar. 25, 1974, Ser. No. 454,575
Claims priority, application Switzerland, Mar. 25, 1973, 4309/73; Sept. 10, 1973, 12959/73; Dec. 31, 1973, 18214/73
Int. Cl.² D04B 15/66
U.S. Cl. 66—154 A 34 Claims

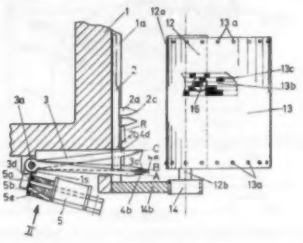
1. A needle selection mechanism for use in cylinder and straight bar knitting machines of the type including a member having a plurality of needle tracks each containing a needle movable from a non-knitting position to a knitting position, said mechanism comprising:

a control member having thereon control-fields the boundaries of which coincide with the boundaries of the pitch between said needles, a portion of said control-fields representing selected needles;

means for scanning said control-fields and generating control pulses representative of the dimension thereof and of at least one whole needle pitch, corresponding to said selected needles;

each of said needles having associated therewith a selector member including a pointed tip, and a fulcrum means for tilting of said member to move said tip thereof from a first non-selected normal position to a second selected position;

a movement element positioned for relative movement with respect to said selector members adjacent said selector members, said movement element comprising means for receiving said control pulses, for causing movement about said fulcrum means of said selector members corresponding to said selected needles, and for causing movement of the tips of said thus selected selector members, into said selected position, with respect to the remainder of said selector members;



a deflector fixedly positioned with respect to said movement element and having a separator tip positioned to contact said tips of said selected selector members, and wedge means contiguous with said separator tip for moving said selected selector members toward said respective needles to cause movement of said selected needles from said non-knitting position; and

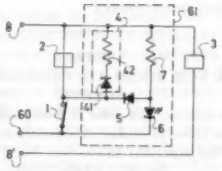
a needle deflector fixedly positioned with respect to said movement element and having an apex with an edge having a tip means for contacting and moving said selected needles into said knitting position.

3,974,665

YARN BREAKAGE DETECTION CIRCUITRY FOR KNITTING MACHINES

Miloslav Rencin, Privrat; Josef Rod, Usti nad Orlici, and Pavel Seidl, Usti nad Orlici, all of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi, Liberec, Czechoslovakia

Filed Oct. 1, 1975, Ser. No. 618,577
Claims priority, application Czechoslovakia, Oct. 1, 1974, 6711-74
Int. Cl.² D04B 35/12
U.S. Cl. 66—163 5 Claims



1. In a circuit for indicating a yarn breakage in a knitting machine and for simultaneously switching the conductive state of a drive coil associated with a yarn drive element of the machine, a first path including magnetically actuated means serially connected with the drive coil for switching the conductive state of the coil when the switching means are operated, means responsive to a yarn breakage of the machine for magnetically operating the switching means from a first state to a second state, normally disabled indication means, and a diode coupled to the indication means and to the first path for maintaining the indication means disabled while the switching

means remain unoperated and for enabling the indication means when the switching means are operated.

3,974,666

APPARATUS FOR BATCH TREATMENT OF TEXTILE MATERIALS

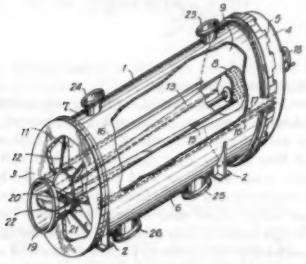
Jean-Paul Coquery, St. Didier au Mont d'Or; Pierre Labedan, Crepieux la Pape, and Raymond Roland, Meyzieu, all of France, assignors to S.T.X., Groupement d'Interet Economique, Neuilly sur Seine, France

Filed Apr. 2, 1975, Ser. No. 564,344

Claims priority, application France, Apr. 12, 1974, 74.13625

Int. Cl.² D06B 5/18

U.S. Cl. 68—8 5 Claims



1. An improved apparatus for batch treatment of textile materials in the form of broad widths which comprises:

a. an enclosure provided with closure means at both ends and said enclosure having lower and upper parts,

b. two perforated hemi-cylindrical plates placed concentrically, respectively, in the said lower and upper parts of said enclosure, said plates being movable vertically,

c. a holder for the textile materials to be treated setting on two rails joined to said enclosure, said holder comprising a perforated tube provided with two end plates and closed at one of its ends, inside of which perforated tube there are a tight coaxial frustum of a cone and an axial horizontal plate joined to said tube, dividing the space between the perforated tube and the tight cone, into two parts of equal volume,

d. a means for introducing treatment fluid, joined to a fixed end of said enclosure, and

e. a means for evacuating treatment fluids from said enclosure.

3,974,667

WASHING MACHINE WITH IMPROVED ADDITIVE DISPENSING MEANS

Ved P. Gakhar, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 20, 1975, Ser. No. 606,049

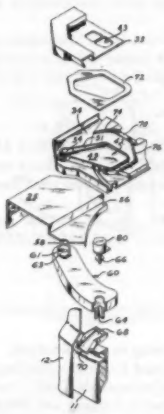
Int. Cl.² D06F 39/02

U.S. Cl. 68—17 R 6 Claims

1. In a treating agent dispenser system for an automatic washing machine of the top loading type having a cabinet with an access lid on the top wall thereof, an outer tub, and a basket placed inwardly therefrom, including a dispenser adapted to be mounted above the machine's wash tub, said dispenser having an upper housing portion, a lower housing portion, a bleach agent compartment, an adjacent compartment in communication with a liquid supply means arranged for directing liquid into said adjacent compartment to flush said compartmert at a predetermined time in a cycle of said automatic washing machine, the improvement comprising:

a. the bleach compartment having a surrounding upstanding wall, a channel in the bottom thereof with a drain opening therein,

b. a sealing gasket overlying the bleach compartment and located between at least a portion of the upstanding wall and the dispenser upper housing portion, and



c. a rib outside the compartment, said rib terminating at an opening in flow communication with the adjacent dispenser compartment for directing any bleach escaping the bleach compartment other than through the drain opening into the adjacent dispenser compartment.

3,974,668

SELF SECURING THEFT PROOF CHAIN BINDER

Delmer L. McWhorter, c/o 929 Drever St., West Sacramento, Calif. 95691

Filed May 27, 1975, Ser. No. 580,570

Int. Cl.² E05B 73/00

U.S. Cl. 70—14 5 Claims

1. A self securing theft proof chain binder comprising a lever arm; a fitting at the inner end of the lever arm; a chain hook attached to the fitting; a first swivel attached to the fitting; a lock attached to the first swivel; a second swivel connected to the lock; another chain hook attached to the second swivel and means forming part of the lever arm for mating with the lock.

3,974,669

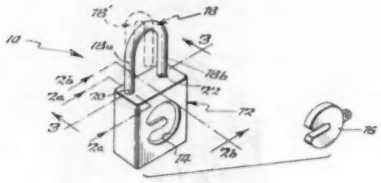
LOCK

Wells F. Stackhouse, Ashville, N.Y., assignor to American Locker Company, Inc., Jamestown, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,682

Int. Cl.² E05B *47/00, 47/04, 51/00, 67/38*

U.S. Cl. 70—276 **8 Claims**



1. A lock comprising in combination:

an operator actuated locking-unlocking mechanism including a member releasable under operator control for movement between locking and unlocking positions;

a lockable member movable between locked and unlocked positions, said lockable member having a recess, said recess defining a stop surface facing generally in the direction of movement of said lockable member towards said unlocked position and a cam surface facing generally towards said stop surface and in the direction of movement of said lockable member towards said locked position;

a bolt for operably interconnecting said member and said lockable member whereby to retain said lockable member in its locked position when said member is in its locking position and to free said lockable member for movement into its unlocked position when said member is in its unlocking position, said bolt being supported for rotary movements about an axis extending essentially transversely of the direction of movement of said lockable member and having first and second spaced portions thereof operably engaging with said member and said lockable member, respectively, said second portion of said bolt including stop means and cam-stop means, said bolt having a first rotatable position when said member is in said locking position wherein said cam-stop means is removed from within said recess and said stop means is inserted within said recess and arranged for engagement by said stop surface for preventing movement of said lockable member into said unlocked position, said bolt having a second rotatable position when said member is in said unlocking position wherein said stop means is removed from within said recess to permit movement of said lockable member towards said unlocked position and said cam-stop means is inserted within said recess, said cam-stop means when said bolt is in said second rotatable position being arranged for engagement by said stop surface to prevent movement of said lockable member beyond said unlocked position, said cam surface engaging said cam-stop means upon movement of said lockable member from said unlocked position towards said locked position for driving said bolt from said second rotatable position into said first rotatable position;

spring means tending to bias said lockable member towards one of said locked and unlocked positions; and

spring means tending to bias said bolt for rotation from said first rotatable position towards said second rotatable position.

3,974,670

TURNOVER KEY AND CORRESPONDING CYLINDER LOCK

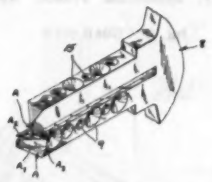
Heinz Wolter, Cologne-Lindenthal, Germany, assignor to Josef Voss KG, Cologne, Germany

Filed Sept. 11, 1973, Ser. No. 396,247

Claims priority, application Germany, Sept. 4, 1973, 2344473

Int. Cl.² E05B *27/00*

U.S. Cl. 70—364 A **2 Claims**



1. A lock system comprising:

a cylinder having a first axis of rotation, said cylinder being formed with a narrow elongated key channel having a second axis of symmetry offset from said first axis;

a row of first keeper pins mounted in said cylinder and movable transversely to said channel while lying in a plane perpendicular to the broad dimension of said channel and offset from said second axis, said pins having conical tips entering into said channel and being displaceable outwardly therefrom to permit rotation of said cylinder about said first axis; and

a key having an elongated blade with beveled edges receivable in said channel and formed along opposite broad faces of the blade with a row of indentations offset from said second axis and adapted to receive said tips upon insertion of said blade in said channel to enable rotation of said cylinder by said key about said first axis, said key being receivable in said channel in two positions offset by 180° about said second axis from one another, said blade having a leading end formed with a respective keyway along each row of indentations and spaced inwardly from the edges of the blade, said keyways each extending forwardly from the broad surface formd with a respective row of indentations to the opposite broad surface of the blade and comprising a ramp of rectangular plan configuration and a pair of flanks converging rearwardly and toward the respective ramp, said tips being frustoconical with small bases fitting between said flanks and said flanks having a convergence corresponding to the taper of said tips, said tips beginning opposite the longitudinal plane of the channel from their mounting in said cylinder, said first keeper pins extending fully across said channel.

3,974,671

CYLINDER LOCKS

Charles Rossetti, 20 rue du Midi, Lausanne Vaud, Switzerland

Filed Feb. 13, 1975, Ser. No. 549,698

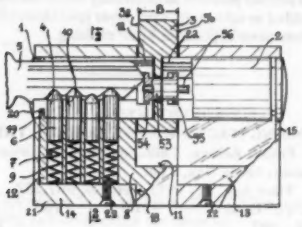
Claims priority, application Switzerland, Feb. 14, 1974, 2079/74

Int. Cl.² E05B *9/04*

U.S. Cl. 70—375 **6 Claims**

1. A cylinder lock comprising two barrels in axial alignment, each barrel being formed as two opposed elements disposed on either side of a longitudinal plane, a web between the barrels and engageable with internal end parts of the barrel elements, the barrels being in alignment on either side of the web and each barrel comprising tumblers received in the barrel and operable by a key engageable in a longitudinal keyhole slot in the barrel, the keyhole slot lying in said longitudinal plane and confronting surfaces of said opposed elements forming the keyhole slot, a lock block formed in one piece and

comprising a central recess through which the web is able to pass and two parts of generally rectangular cross section on either side of the central recess, each having a narrow top surface contiguous with one of the barrels pins received in bores in the lock block extending to the latter surfaces, the



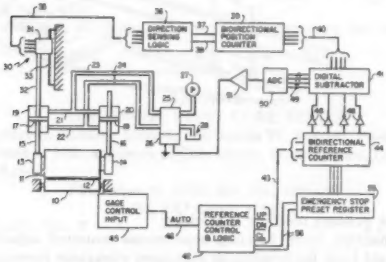
pins being spring-biased so that the pins normally engage in recesses in the barrels to lock the same when the key is absent, and two housing members each engaging over one of said rectangular parts and the corresponding barrel to maintain the barrels in contact with said parts.

3,974,672

MILL HYDRAULIC SCREW-DOWN

John F. Herbst, 175 Taylor Ave., Cheshire, Conn. 06410

Filed Sept. 19, 1975, Ser. No. 615,102
Int. Cl.² B21B 37/08, 31/34, 31/32
U.S. Cl. 72—21 5 Claims



1. An apparatus for controlling the position of a roll in a rolling mill of the type having first and second rolls, means for passing a length of material between the rolls for altering the thickness thereof, hydraulic piston and cylinder means coupled to the first one of the rolls for changing the position of the first roll to change the spacing between the rolls, and a source of hydraulic fluid under pressure, the apparatus comprising the combination of:

position responsive means directly coupled to the piston of the piston and cylinder means and movable therewith, said position responsive means including optical encoder means for producing digital electrical signals representative of the magnitude and direction of motion of said piston;

bidirectional position counter means for receiving and counting said digital signals and for maintaining a cumulative count representative of roll position;

bidirectional reference counter means for maintaining a count representative of desired roll position;

means including a pulse source for selectably delivering pulses to said reference counter means to establish a count representative of desired roll position;

digital summing means connected to said bidirectional position counter and to said bidirectional reference counter for producing a digital signal representative of the difference between actual roll position and desired roll position;

a servo valve connected to the source of fluid under pressure and to the piston and cylinder means; and

converter circuit means coupled to said summing means for converting said signal representative of the difference and for delivering a proportional drive signal to said servo valve,

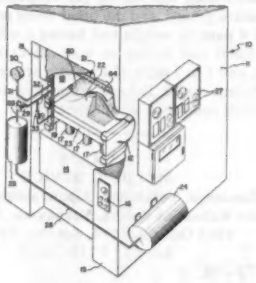
said valve being responsive to said drive signal to deliver fluid under pressure to the piston and cylinder means whereby said roll is driven toward said desired position.

3,974,673

TITANIUM PARTS MANUFACTURING

John P. Fosness, and Louis Odor, both of Columbus, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1975, Ser. No. 566,007
Int. Cl.² B21D 26/02; B21J 5/04, 1/06; B21D 37/16
U.S. Cl. 72—38 5 Claims



1. In a method of manufacturing a titanium alloy sheet metal part having a three-dimensional form portion within an essentially flat periphery portion from a substantially flat sheet of titanium alloy, the steps of:

a. Clamping said titanium alloy sheet continuously around its periphery between the clamping face of a pressurizable chamber containing an electrical resistance heater means offset from said pressurizable chamber clamping face and the clamping face of an opposed and aligned chamber containing a die member with a ceramic forming surface corresponding in shape and size to said metal part three-dimensional form

b. Directly radiantly heating said clamped sheet to a maximum temperature in the range of approximately 850° C to 950° C only with respect to surface areas substantially outside the planform projection of said ceramic forming surface by said electrical resistance heater means and with an argon atmosphere in said pressurizable chamber at a first fluid pressure that is elevated with respect to ambient pressure and that is not less than approximately 0.3 kilograms per square centimeter and in said opposed and aligned chamber that is at a second fluid pressure that is substantially less than said first fluid pressure;

c. Maintaining said clamped sheet at temperatures within said maximum temperature range and said argon atmosphere at said fluid pressure until surface portions of said clamped sheet periphery conform to said die member ceramic forming surface;

d. Cooling said clamped sheet conformed surface portions to a temperature not substantially exceeding approximately 550° C; and

e. Releasing said clamped sheet from its clamped condition between said chamber clamping faces after reducing said argon atmosphere fluid pressure to ambient pressure.

3,974,674

COMPOSITION FOR AND METHOD FOR PREPARATION OF METAL FOR SUBSEQUENT COLD WORKING

Gilbert H. Orozco, Euclid, and Donald N. Logsdon, Cleveland, both of Ohio, assignors to Man-Gill Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 323,067, Jan. 12, 1973, abandoned. This application May 20, 1974, Ser. No. 471,326
Int. Cl.² C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 72—42 24 Claims

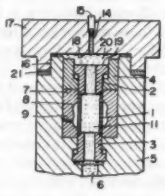
1. A metal-forming composition suitable for mixing with water and forming a dispersion for application to metal surfaces to form thereon a dried solid film comprising a mixture consisting essentially of 30 to 75 parts of a water-soluble glass-forming solid pigment selected from the group consisting of alkali metal phosphates and borax, 0 to 10 parts of an alkali metal nitrite, 0 to 2 parts of fine $CaCO_3$, 0 to 10 parts of calcium stearate, 0 to 30 parts of fine inorganic pigment selected from the group consisting of silica aerogels, silica xerogels, fume silica, and barium sulfate, 10 to 80 parts of an alkali metal fatty acid soap having a titre of at least 40°C.; two water-soluble polymers, one being present in amounts of 1 to 10 parts by weight and having a molecular weight above 2,000 being film-forming and having per molecule at least 10 carboxyl-reactive groups, and the other being present in amounts of 0.5 to 4 parts by weight and having a molecular weight of at least 3,000 and having at least 10 carboxyl groups per molecule, and 1 to 5 parts of a surface active agent containing a polyethylene oxide linkage connected to a hydrophobic group, which comprises an alkylphenol.

3,974,675

MOLDING DEVICE

Hiroshi Tominaga, Yokohama, Japan, assignor to Tokyo Sharyo Seizo Kabushiki Kaisha, Yokohama, Japan

Filed Oct. 30, 1974, Ser. No. 519,315
Int. Cl.² B21D *26/02*
U.S. Cl. 72—56 12 Claims



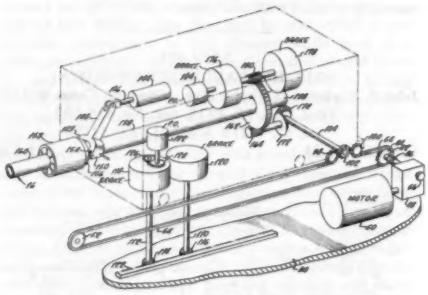
1. A hydraulic impact molding device comprising, in combination, a housing, a mold for a hollow workpiece removably mounted in said housing, said mold having a mold cavity therein, first and second coaxial pistons slidably mounted in said housing, said first and second pistons being reciprocably slidable between first and second positions, said first and second pistons being arranged in mirror image relationship at substantially opposite ends of said mold, said mold having first and second piston ports corresponding to said first and second pistons through which said first and second pistons respectively communicate with said mold cavity, said mold cavity being adapted to receive a hollow workpiece having opposite open ends respectively mountable in said first and second piston ports, said first and second pistons correspondingly abutting opposite open ends of a workpiece mounted in said mold cavity, means for hydraulically synchronously sliding said first and second pistons a predetermined distance into said mold cavity through said respective first and second piston ports for axially deforming a workpiece mounted therebetween into the conformation of said mold cavity, means mounted in said housing for limiting the corresponding sliding movement of said first and second pistons into said mold cavity and a cover for said mold, said cover being slidably mounted on said housing and having an axial orientation relative to said mold, said cover being slidable between a first normal position in which said cover is supported on said housing and a second position which is raised relative to said first position, said cover being slidable from said normal first position to said second position substantially at the instant a workpiece is molded in said mold, said cover spontaneously returning to its first normal position after molding.

3,974,676

TUBE BENDING MACHINE AND CARRIAGE THEREFOR

Homer L. Eaton, Balboa, Calif., assignor to Eaton-Leonard Corporation, Santa Ana, Calif.

Filed Apr. 11, 1975, Ser. No. 567,288
Int. Cl.² G06F *15/46;* B21D *7/12;* F16H *21/16*
U.S. Cl. 72—307 23 Claims



1. A bending machine comprising
a machine body, bending head means mounted adjacent said body for bending an elongated workpiece presented thereto,
and
means for presenting an elongated workpiece to the bending head means at selected axial and rotational positions of the workpiece, said means for presenting comprising
a track mounted on the machine body,
a carriage movable on the track,
rotatable chuck means journalled on the carriage for grasping and axially rotating a workpiece for presentation to the bending head means,
a driven, flexible tension element mounted on said body, and
drive means coupled with said tension element for independently rotating said chuck means or moving said carriage along said track.

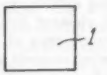
16. Dual driving apparatus comprising
a drive member,
first and second driven members,
first and second coupling means for driving said driven members respectively in response to said drive member,
means for driving said drive member, and
drive selector means for selectively differentially restraining said driven members to thereby relatively increase the response to said drive member of that one of said driven members under lesser restraint.

3,974,677

FORGING OF METAL COMPONENTS

Claude Castellani, Versailles, and Yves Roger, Meudon-la-Foret, both of France, assignors to Regie Nationale des Usines Renault and Automobiles Peugeot, both of France

Filed Feb. 3, 1975, Ser. No. 546,522
Claims priority, application France, Feb. 18, 1974, 74.05410
Int. Cl.² B21D 28/00
U.S. Cl. 72—340 5 Claims



1. A method for the production of a petalled component by cold-forging and comprising the steps of:

a. producing, during a first forging operation, a blank which has dimensions corresponding approximately to those of the petalled component to be obtained and which has a peripheral chamfer from which will be produced a stem;

b. roughing out, during a second forging operation, petals and the stem by reverse and direct drawing respectively, and producing in the end face of the blank a recess centrally of the petals and extending by radial recesses to the periphery of said end face;

c. pushing, during a third forging operation, the base and lower end of the lateral faces of each radial recess in the direction of the stem to produce a lateral surface or ramp at the side adjacent the axis of the component, which is oblique with respect to said axis, and defines each radial recess of said component and is extended on the opposite side to said axis, by a surface constituted by a surplus wall, and

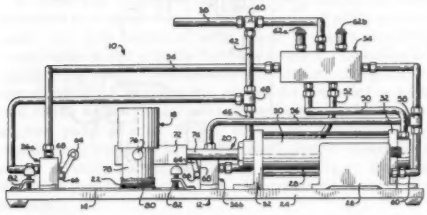
d. cutting of, during a fourth forging operation, said surplus wall.

3,974,678

AUTOMATIC PAINT CURE TESTER

Robert L. Rooney, Ellicott, and James W. Sautter, Pasadena, both of Md., assignors to Conchemco, Incorporated, Lenexa, Kans.

Filed Mar. 5, 1975, Ser. No. 555,402
Int. Cl.² G01N 3/56
U.S. Cl. 73—7 4 Claims



1. An automatic tester for performing consistently accurate and uniform tests to determine the cure of a film of paint or the like on a test panel, said tester comprising:

a base provided with clamp means for releaseably receiving and holding said panel in a position to present said film of paint or the like in an upwardly facing direction;

weight means of a selectively predetermined weight adapted to be placed on said panel;

a quantity of absorbent material releaseably secured to said weight means in a disposition to be interposed between said weight means and said film when said weight means is placed on the panel;

a selectively actuatable drive mechanism coupled with said weight means for repeatedly shifting the same across said panel along a predetermined path of travel with said material being in contact with the film,

said drive mechanism including an elongate, reciprocably shiftable member having a distal end at which said weight means is attached,

said material being saturated with a supply of solvent of a predetermined type corresponding to the test for which the cure of the film is to be determined; and

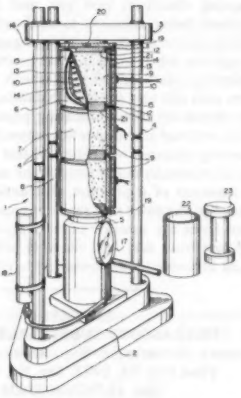
control means located adjacent the panel at the opposite ends of said path of travel of said member and coupled with said drive mechanism for automatically reversing the direction of travel of said member when the latter engages said control means such that said solvent saturated material exerts a uniformly repetitious rubbing action on said film.

3,974,679

ACCELERATED CONCRETE STRENGTH TESTING

Karim W. Nasser, Saskatoon, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Sept. 2, 1975, Ser. No. 604,878
Int. Cl.² G01N 3/10
U.S. Cl. 73—15.6 7 Claims



1. A method for accelerated strength testing of concrete comprising:

a. placing a concrete mix sample in a container and sealing the container;

b. applying a predetermined pressure to the sample;

c. supplying heat to the sample under predetermined conditions to raise the temperature thereof, while maintaining the pressure of the sample substantially constant;

d. cooling the sample under predetermined conditions; and

e. measuring the compressive strength of the sample.

3,974,680

PIPELINE LEAK DETECTOR

Ruby C. Beaver, Houston, Tex., assignor to Inspection Technology Development, Inc., Houston, Tex.

Filed May 27, 1975, Ser. No. 581,099
Int. Cl.² C01M 3/28
U.S. Cl. 73—40.5 R 17 Claims

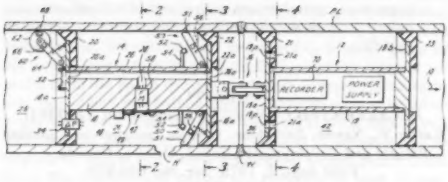
1. An apparatus for inspecting a pipeline for leaks, comprising:

a support, said support movable through said pipeline;

means mounted on said support for defining a test chamber which is exposed to the inner wall of the pipeline to be inspected as the support moves therethrough;

first means for selectively communicating pipeline fluid from a region in said pipeline in the vicinity of but external of said inspection apparatus to said test chamber so that fluid pressure is exerted against the inner wall of the pipeline in said chamber, whereby fluid in said chamber will escape through any pipeline deformity which is a source of a pipeline leak;

means for measuring the differential in pressure between said test chamber and said region so that fluids leaking from said chamber will cause a change in said differential pressure which may be indicative of pipeline leaks, said pressure differential measuring means generating a signal indicative of the magnitude of said pressure differential;



means connected to said support for defining a pressure balancing chamber, said test and pressure balancing chambers being adjacent to each other and divided by resilient means which yieldably engages the inner wall of the pipeline when in its normal position and deformable by pipeline obstructions to establish communication between said test and pressure balancing chambers; and

second means for communicating pipeline fluid from said region external said inspection apparatus to said pressure balancing chamber whereby said test and pressure chambers are normally maintained at the same pressure so that the traversal of a pipeline obstruction by said resilient means which causes said resilient means to become disengaged from the interior of said pipeline will not cause fluid loss from said test chamber which might be interpreted erroneously as caused by a pipeline leak.

3,974,681

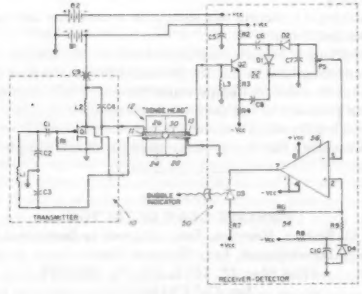
ULTRASONIC BUBBLE DETECTOR

Jerry Namery, 21 Larkspur Way, Natick, Mass. 01760

Filed Oct. 23, 1973, Ser. No. 408,269

Int. Cl.² G01N *29/02*

U.S. Cl. 73—67.5 R **19 Claims**



1. An ultrasonic through-transmission bubble detector for use with a hollow, flexible tube for feeding liquid and comprising:

a first sound coupling element arranged on one side of the tube and having one end defining a concave lensing surface contacting the tube;

transducer means coupled to the other end of said first sound element;

means applying a signal to said transducer means for causing said transducer means to establish a collimated ultrasonic signal in the first sound element;

a second sound coupling element arranged on the opposite side of the tube to the first sound element to unidirectionally receive the ultrasonic signal transmitted through the tube and the liquid disposed in the internal space defined by the tube;

said second sound coupling element having one end defining a concave lensing surface contacting the tube;

said first and second element lensing surfaces extending about a major circumference of the tube but defining a gap between the facing element ends;

the total gap circumference being less than the lensing surface circumference;

said first and second sound coupling elements both being constructed of a material having a greater acoustic velocity than that of the liquid or tube to provide a first refractive index between the first sound coupling element and tube greater than unity at the lensing surface of the first element, and a second reciprocal refractive index between the tube and second sound coupling element at the lensing surface of the second element;

said lensing surfaces and said material in combination providing a lensing effect, respectively, whereby the beam pattern of the ultrasonic signal is converged inside the tube and collimating the ultrasonic signal with the minimum width of the beam pattern inside the tube being less than the inner diameter of the tube;

and means coupled from the second sound element for receiving the collimated ultrasonic signal including means for establishing an alarm condition.

3,974,682

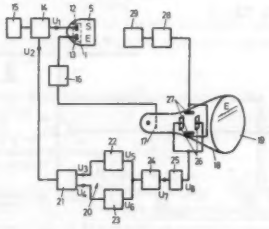
ULTRA SOUND EXAMINING DEVICE

Richard Soldner, Erlangen, and Rudolf Rattmann, Herzogenaurach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 367,145, June 5, 1973, Pat. No. 3,902,357. This application Mar. 5, 1975, Ser. No. 555,359

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.7 **3 Claims**



1. An ultra sound examining device, particularly for medical purposes, operating according to the impulse-echo process, said device comprising an ultra sound sending and receiving system having an ultra sound sender and a receiver, a precursor stretch, such as water delay coupling means connected to the front of said ultra sound sending and receiving system, an echo impulse representation device, such as a cathode ray tube, and an actuating means connecting said ultra sound sending and receiving system with said echo impulse representation device, wherein said ultra sound sender comprises energizing means for energizing said sender to transmit successive impulses which are spaced in time from each other by a value which is smaller than the sum of the precursor time of

ultra sound impulses in the precursor stretch and the representation time of echo impulses on the representation device, but the smallest value being not less than the representation time, and wherein said actuating means actuate said echo impulse representation device depending upon transmitted impulses of said ultra sound sender to visually represent echo ultra sound impulses produced by a transmitted impulse always during time of travel of next successive sent impulse in said precursor stretch, wherein said energizing means comprise a sweeping oscillator for frequency-modulating repetition frequency of transmitted impulse of said ultra sound sender, said actuating means comprising at least two monostable multivibrators connected in parallel between said ultra sound impulse sender and said echo impulses representation device, said monostable multivibrators being triggered alternately by successive transmitted impulses and producing, when triggered, an output impulse, said output impulse having the duration of the precursor time and at its end actuating said echo impulse representation device to visually represent echo impulses.

3,974,683

ULTRASONIC APPARATUS FOR DETERMINING THE VOLUME OF BUBBLES IN LIQUID

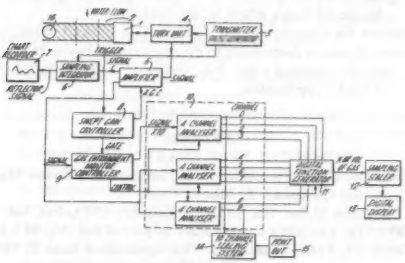
Roger Martin, Reading, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Sept. 13, 1974, Ser. No. 505,776

Claims priority, application United Kingdom, Sept. 17, 1973, 43608/73

Int. Cl.² G01N *29/02*

U.S. Cl. 73—432 PS **4 Claims**



1. Apparatus for measuring the gaseous content of bubbles entrained in a liquid, comprising means for irradiating a liquid under test with pulses of ultra sound having a wavelength comparable in size with the bubbles, means for detecting echo signals from the bubbles, an amplifier for amplifying the echo signals, means for varying the gain of the amplifier as a function of the time which elapses subsequent to the emission of a given pulse of ultra sound, means for producing output signals proportional to the amplified signals raised to the power of three halves, and means responsive to the output signals to provide an indication of the gaseous content of the bubbles.

3,974,684

ULTRASONIC SYSTEM FOR FOCUSING AT AN OBLIQUE ANGLE OF INCIDENCE

Maurice Roule, St-Georges, and Robert Saglio, Massy, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 28, 1974, Ser. No. 455,858

Claims priority, application France, Apr. 2, 1973, 73.11736

Int. Cl.² G01N *29/04*

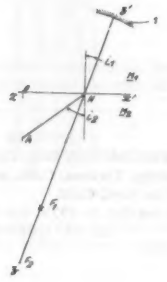
U.S. Cl. 73—71.5 US **7 Claims**

1. A focusing ultrasonic system, which can be employed at any angle of incidence, for testing a part having a surface of separation from the ambient medium in which the ultrasonic system is placed and for producing a single focal point in said part, said system having an active surface formed from a portion of a surface of revolution having an axis which is perpendicular to said surface of separation and wherein at every point on said active surface the ratio of the distance from the point of impact with the surface of separation of an ultrasonic wave generated at said active surface point to

1. the focal point of the ultrasonic waves generated along a first curve on said active surface formed by the intersection of said surface of revolution and a first plane defined by

a. said axis of revolution, and

b. said active surface point and said impact point, and



2. the focal point of the ultrasonic waves generated along a second curve on said active surface formed by the intersection of said surface of revolution and a second plane which is

a. orthogonal to said first plane, and

b. includes said active surface point and said impact point, is equal to:

$$\left(\frac{\cos i_1}{\cos i_2}\right)^2$$

wherein i_1 is the angle of incidence of the ray, i_2 is its angle of refraction and the focal points referred to in (1) and (2) are the points at which said ultrasonic waves would be focused if said part and said ambient medium were identical.

3,974,685

TIGHTENING SYSTEM AND METHOD

Richard A. Walker, Warrington, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Sept. 19, 1974, Ser. No. 507,547

Int. Cl.² G01L *5/24*

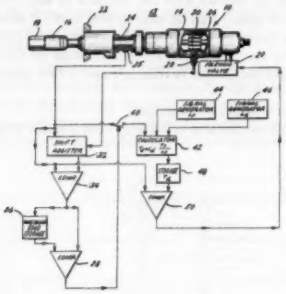
U.S. Cl. 73—88 F **13 Claims**

1. A method for tightening a fastener assembly to a desired load, said method comprising:

tightening the fastener assembly to a predetermined load characterized by a known structural condition of the fastener assembly by applying torque thereto:

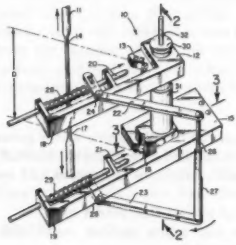
determining the torque applied to the fastener assembly at the predetermined load;

calculating the torque required to tighten the fastener assembly to the desired load by utilizing the determined



torque and predetermined load; and,
tightening the fastener assembly to the calculated torque.

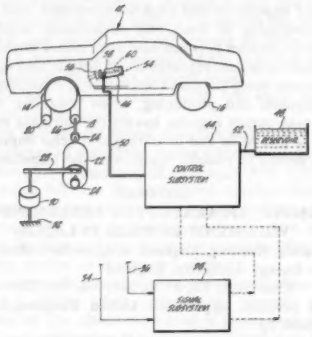
3,974,686
EXTENSOMETER FOR TENSILE TESTER
Max Van Mastrigt, Tarzana, Calif., assignor to W. C. Dillon & Co., Inc., Van Nuys, Calif.
Filed Oct. 1, 1975, Ser. No. 618,414
Int. Cl.² G01N *3/08*
U.S. Cl. 73—95 **7 Claims**



1. An extensometer for indicating the change in length of a specimen between first and second points, spaced a given distance apart along said specimen when said specimen is subject to a load, including, in combination:

a. a first member defining a first gripping means for engaging said specimen at said first point;
b. a second member defining a second gripping means for engaging said specimen at said second point;
c. guide means coupling the first and second members together for movement towards and away from each other in response to changes in said given distance;
d. a probe element;
e. biasing means carried by said first member connected to said probe element for biasing said probe element towards and away from said second member; and
f. strain gage flexure means carried by said second member in a position to be engaged by said probe element and responsive to the force exerted by said probe element to provide an electrical signal constituting a function of said force whereby changes in the distance between said first and second points on said specimen changes said force so that said electrical signal indicates the changes in said given distance.

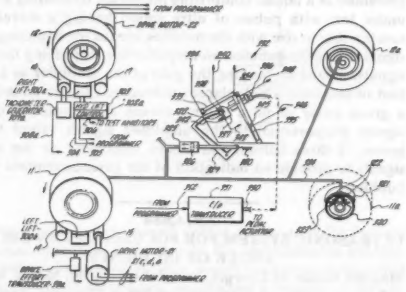
3,974,687
RATE CONTROL SYSTEM FOR A BRAKE TESTING APPARATUS
Carl Junior Asmus, and Woodrow Christman Wickersham, both of Temple City, Calif., assignors to Clayton Manufacturing Company, El Monte, Calif.
Filed May 6, 1975, Ser. No. 574,902
Int. Cl.² G01L *5/28*
U.S. Cl. 73—126 **15 Claims**



1. A rate control system, for a brake testing apparatus which applies actuating force to a brake, comprising:

signal means for generating a signal representing the rate of change of brake effort at the brake;
means for comparing that signal with a desired value; and
control means responsive to divergencies between the signal and the desired value for causing a variation in the rate of brake application.

3,974,688
COMPUTER TYPE BRAKE ANALYZER
Edwin Lee Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.
Division of Ser. No. 382,538, July 25, 1973, Pat. No. 3,899,916, which is a continuation-in-part of Ser. No. 811,168, March 27, 1969, abandoned. This application June 5, 1975, Ser. No. 584,174
Int. Cl.² G01L *5/28*
U.S. Cl. 73—126 **15 Claims**



1. In an apparatus for analyzing the braking performance of a wheeled vehicle having wheel brakes individually associated with at least two wheels and a brake actuator for simultaneously applying the brakes of said wheels, the combination which comprises:

test means for rotating said wheels of the vehicle;
brake effort signal generating means including the test means for producing a separate brake effort signal for

each wheel, the brake effort signals being proportional to the brake effort of the respective wheel while the wheel brakes are being applied; and

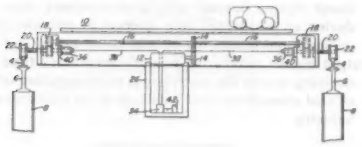
means responsive to the brake effort signals for producing a brake engagement lag imbalance signal representative of the difference between said brake effort signals when the last to engage brake has engaged after operation of the brake actuator.

3,974,689

SYSTEM FOR DETECTING FAULTS ALONG AN ELECTRIC OVERHEAD TRAVELING CRANE RUNWAY

Thomas Karl McNeil, Merrillville, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1975, Ser. No. 557,445
Int. Cl.² G01M *19/00*
U.S. Cl. 73—146 **14 Claims**



1. A method of detecting faults along an electric overhead traveling crane runway comprising the steps of

moving the crane along the runway,

detecting axial movement of a crane wheel drive shaft as the crane moves along the runway,

converting the detected movement into an electrical signal having an amplitude corresponding to the magnitude of the movement,

recording graphically the amplitude of the electrical signal as the crane moves along the runway, and

recording on the graphical representation of the electrical signal a plurality of longitudinal runway locations correlated with the electrical signal derived from detected movement at each such location.

11. Apparatus for detecting faults along an electric overhead traveling crane runway comprising

means mounted on the crane for detecting axial movement of a crane wheel drive shaft and providing an electrical signal having an amplitude corresponding to the magnitude of the movement as the crane moves along the runway,

means connected to the means for providing a signal for amplifying the electrical signal and

means connected to said amplifying means for providing a graphical representation of the amplitude of the electrical signal along the crane runway.

3,974,690

METHOD OF AND APPARATUS FOR MEASURING ANNULUS PRESSURE IN A WELL

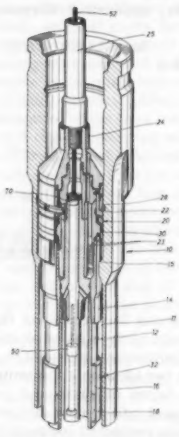
Bill M. Brock, Jr., Stafford; Leo Jude Marquette, and Norman Allen Nelson, both of Houston, all of Tex., assignors to Stewart & Stevenson Oiltools, Inc., Houston, Tex.

Filed Oct. 28, 1975, Ser. No. 625,974
Int. Cl.² E21B *47/06*
U.S. Cl. 73—151 **9 Claims**

1. An annulus pressure monitor for measuring the pressure in the annulus between two coaxial well conduits comprising,

pressure measuring means movable in response to pressure adapted to be positioned in the well in said annulus, and

means for measuring the movement of the pressure measuring means by wave signals and transmitting said measurement to the well surface thereby providing at the well surface an indication of the pressure in the annulus.

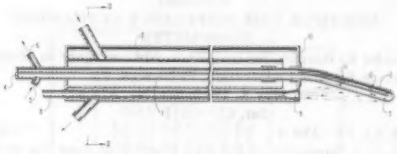


3,974,691

APPARATUS FOR MONITORING STEELMAKING

Eugenio Repetto, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed July 23, 1974, Ser. No. 491,149
Claims priority, application Italy, July 23, 1973, 51588/73
Int. Cl.² G01K *17/00*
U.S. Cl. 73—190 R **3 Claims**



1. A calorimetric probe adapted to be exposed directly for at least a part of its length to hot gases, said probe comprising an elongated tube having an elongated exposed portion, a cooling jacket surrounding said tube rearwardly of said exposed portion, said exposed portion extending lengthwise beyond said jacket, a pair of thermometric elements for the indication of temperature at two points spaced lengthwise of the probe, said thermometric elements being disposed inside the tube at said two spaced points, the outer side wall of said tube at said two points being disposed outside said cooling jacket and exposed to said hot gases, means for passing a fluid inside the tube in sequence over first one of said elements and then the other of said elements, said tube comprising a straight portion inside said cooling jacket, said exposed portion being obliquely angled relative to said straight portion, and means to project abraisve particles in a directional paralled to said straight portion to impinge on said oblique exposed portion.

3,974,692

APPARATUS FOR THE MEASUREMENT OF THE VELOCITY OF MEDIA FLOWING IN CONDUITS

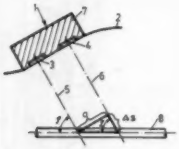
Dieter Hassler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Aug. 14, 1974, Ser. No. 497,496

Claims priority, application Germany, Aug. 16, 1973, 2341476

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **13 Claims**



1. In an apparatus for measuring the velocity of media flowing in conduits, such as blood in its vessels, through the intermediary of ultrasound pursuant to the Doppler effect-method, at least two ultrasonic transmitter-receivers for projecting inclined beams of ultrasound into said medium and receiving ultrasound reflected by said medium; said transmitter-receivers being positioned proximate each other at a predetermined spaced relationship and oriented so that their respective transmitting and receiving directions extend in parallel to each other, and means for determining a value proportionate to the flow velocity of said medium from the frequencies of the emitted and received ultrasound the improvement comprising; time measuring means connected to said transmitter-receivers for detecting the time interval between timewise successively received sound waves and particularly for measuring the time differential between receipt of the ultrasound reflected by said medium at, respectively, a first and a second of said transmitter-receivers upon concurrent beaming of ultrasound from both said transmitter-receivers into said medium; and means for mathematical processing of said measured time differential.

3,974,693

MULTIPLE TIME DIFFERENCE ULTRASONIC FLOWMETER

Charles E. Hardies, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1975, Ser. No. 574,671

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **7 Claims**

1. In a flowmeter of the type wherein at least one pair of oppositely disposed ultrasonic transducer means are located in acoustic contact with a fluid stream and in upstream-downstream relation thereto; first feedback means connecting the output of a first of said transducer means to the input of a second of the transducer means such that upon one acoustic signal being transmitted upstream from the second transducer means to the first transducer means the transmission of another acoustic signal upstream is initiated from said second transducer means when said one upstream acoustic signal is received by said first transducer means, thus generating an upstream train of acoustic signals in sing-around fashion and a first corresponding series of pulse signals is generated in said first feed-back means; a second feedback means connecting the output of said second transducer means to the input of said first transducer means such that upon one acoustic signal being transmitted downstream from said first transducer means to the second transducer means the transmission of another acoustic signal downstream is initiated from said first transducer means when said one downstream acoustic signal is received by said second transducer means, thus generating a downstream train of acoustic signals in sing-around fashion and a second corresponding series of pulse signals is generated in said second feedback means;

gating means for causing said upstream and downstream train of acoustic signals to occur between said first and second transducer means each during a predetermined time interval;

means responsive to said first and second series of pulse signals for deriving successive elementary time intervals between opposite pulses of said first and second series of pulses, said elementary time interval increasing by Δt increments from one received acoustic signal to the next; the combination of:

counting means responsive to one of said first and second series of pulses for counting the pulses in the corresponding one of said feedback means during said predetermined time interval, and responsive to a reference count for comparing the count of pulses during said predetermined interval with said reference count for deriving a count error representative of speed of sound variation in said fluid relative to a reference speed of sound,

means for extending the sing-around operation of said transducer means beyond said predetermined time interval during an additional time interval to provide additional pulses equal in number to said count error, and

output means responsive to said elementary time interval deriving means for providing a representation of the last of said elementary time intervals as an indication of fluid velocity.

3,974,694

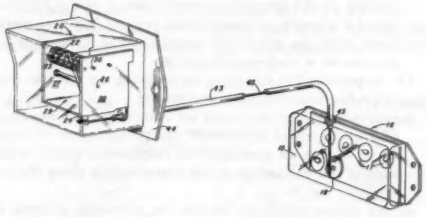
REMOTE DIGITAL INDICATOR ATTACHMENT FOR A GAS METER

Arthur C. Eberle, Columbus, Ohio; Robert G. Venendaal, Wilmington, Del., and William D. Munk, Columbus, Ohio, assignors to Columbia Gas Service Corporation, Columbus, Ohio

Filed Sept. 24, 1975, Ser. No. 616,382

Int. Cl.² G01F *15/06*; G06M *1/08*

U.S. Cl. 73—272 A **6 Claims**



1. A remote meter reading assembly for a meter having a rotary index shaft comprising: a circular disc mounted on the index shaft of a meter; a digital counter adapted to be mounted in remote relation to the meter and having a reciprocative actuator arm; a flexible cable connected in constant tension between the actuator arm of said counter and an eccentric crank pin mounted on said disc whereby upon rotation of said shaft and disc the actuator arm is moved in one direction only; spring means connected with the actuator arm of said counter for moving it in the opposite direction; a sheath of polymeric material loosely circumscribing the cable for most of its length and including strands of a material embedded in the polymeric material which extends the length of the sheath, said sheath having a coefficient of thermal expansion substantially the same as the cable and means for disengaging the disc from the rotary shaft upon application of excess tension to the cable.

3,974,695

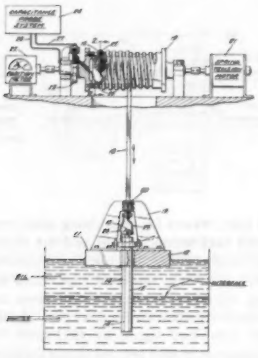
DOUBLE LEVEL GAUGE

Julius Lerner, Broomall, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 18, 1975, Ser. No. 605,779

Int. Cl.² G01F *23/10, 23/26*

U.S. Cl. 73—304 C **6 Claims**



1. In a container holding two immiscible fluids, a first fluid having a density less than a second fluid so that the first fluid floats on top of the second fluid, a system for determining the free surface level of the liquids and the depth of the first fluid, and comprising:

a. means for determining the depth of the first liquid having,

i. a capacitance probe having a length sufficient to pass vertically through the first liquid,

ii. movable means, located at the free surface level, for maintaining the capacitance probe in a vertical position so that the capacitance probe passes entirely through the first liquid, and

iii. means for receiving and indicating the capacitance value of the capacitance probe, said capacitance value being related to the depth of the first fluid; and

b. means for determining the free surface level of the two liquids by determining the level of the maintaining means.

3,974,696

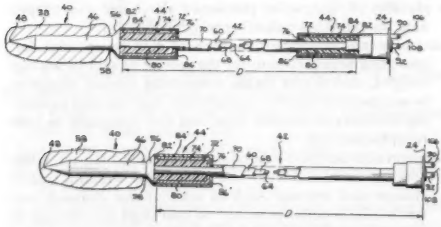
FOOD THERMOMETER FOR MICROWAVE OVEN

Louis H. Fitzmayer, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 446,169, Feb. 27, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 616,050

Int. Cl.² G01K *1/08, 7/24;* **G08B** *21/00*

U.S. Cl. 73—352 **14 Claims**



1. Apparatus for monitoring the internal temperature of food being cooked in the cooking cavity of a microwave oven with microwaves of a predetermined frequecy having a predetermined wavelength λ, said apparatus comprising:

a. a temperature-sensing probe adapted for insertion into the food to be cooked, said probe including an elongated conductive housing having a reference point to indicate optimum insertion depth into the food, the distal end of said housing being closed and shaped to facilitate insertion into the food, and said probe further including a thermally-responsive electrical element positioned internally of said housing near the distal end;

b. circuitry responsive to thermally-induced changes in a characteristic of said electrical element to produce a control effect indicative of the food temperature; and

c. a flexible shielded cable connecting said electrical element to said circuitry, said cable having first and second ends and generally extending between said probe and a wall of the cooking cavity, said first end of the cable shield being connected to said probe housing; and

d. a choke for presenting a high impedance to microwave energy of wavelength λ, said choke being coupled to the cable shield at said second end of the cable shield to electrically isolate said second end of the cable shield from the cooking cavity wall at the predetermined microwave freqeuncy;

the total effective electrical length of said cable measured along said cable, from said choke to the reference point on said housing, being approximately equal to $n\ \lambda/2$, where n is any integer, whereby in use the cable is nonresonant at said predetermined wavelength λ, said electrical element is completely shielded from microwave energy, and the cable shield is isolated from said cavity wall.

3,974,697

METHOD AND APPARATUS FOR SAMPLING A LIQUID STREAM

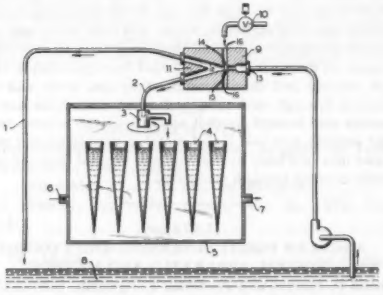
Sebastian Speth, Oberhausen, Germany, assignor to Ruhrchemi Aktiengesellschaft, Germany

Filed Oct. 21, 1974, Ser. No. 516,295

Claims priority, application Germany, Oct. 29, 1973, 2354091

Int. Cl.² G01N *1/14*

U.S. Cl. 73—422 R **9 Claims**



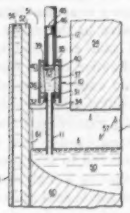
1. A method for intermittently sampling a flowing fluid stream comprising the steps of removing at least a portion of the stream and forming it into a jet having an initial axis, directing the flow of the jet along a first path at an angle of 10 to 60° to the axis of the jet by forming a pressure differential across the width of the jet, the pressure being lower in the direction of the first path, intermittently redirecting the flow of the jet to a second path by reducing the pressure differential one of said paths being directed to a sample collector, said jet being directed to the sample collector for periods of 1/10 second or less.

3,974,698

MOLTEN METAL SAMPLER FOR ELECTROSLAG REFINING PROCESS

William W. Scott, Jr., Parkesburg, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Filed Jan. 24, 1975, Ser. No. 544,011
Int. Cl.² G01N *1/14*
U.S. Cl. 73—425.6 **22 Claims**



1. A liquid metal vacuum sampler for sampling metal produced by the electroslag refining remelting process during the process while voltage is applied to the consumable electrode and to the mold whereby the sampler draws metal through the slag between the electrode and mold, the dampler comprising a first conduit which is insulated, a three-way valve, a second conduit interconnecting one end of said first conduit and said three-way valve, third and fourth conduits connected to said three-way valve, a source of inert gas under pressure higher than the ambient atmospheric pressure, said source having a fluid passageway to said three-way valve via said third conduit which is connected to said inert gas source, a vacuum source connected to said fourth conduit whereby fluid entering said fourth conduit and said three-way valve is drawn to said vacuum source through said fourth conduit, a hollow body for receiving a sample connected to the other end of said first conduit, said body being relatively enlarged and provided with sufficient insulation to preclude accidental short circuiting of said electrode and said mold, said body including a removable plate means for removing the sample metal therefrom a tube composed entirely of a material having a high dielectric constant connected to said body, said tube being of sufficient length to extend through the slag of an electroslag remelting process and into the liquid metal, whereby when said second conduit is connected by said three-way valve to said inert gas source, an inert gas flows from said inert gas source via said first, second and third conduits into said body and is discharged through said tube and when said three-way valve conects said second conduit to said vacuum source and said tube extends into said liquid metal, a sample of said metal is drawn into said body by said vacuum via said first, second and fourth conduit through said tube.

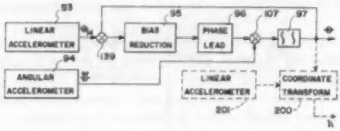
3,974,699

ANGULAR POSITION SENSING AND CONTROL SYSTEM, APPARATUS AND METHOD

Harold D. Morris, and Frederick J. Sigworth, both of Orinda, Calif., assignors to Systron Donner Corporation, Concord, Calif.

Division of Ser. No. 392,257, Aug. 28, 1973, Pat. No. 3,899,028, which is a continuation-in-part of Ser. No. 239,660, March 30, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,572
Int. Cl.² G01C *9/00, 9/08*
U.S. Cl. 73—432 R **13 Claims**

1. In apparatus for sensing the attitude relative to a local horizontal reference of a part on a machine having a framework supporting said part while said framework is free to move relative to the local horizontal reference, a linear accelerometer adapted to be mounted on said part having a sensitive axis for detecting departure thereof from the local horizontal reference and for producing a first signal representing a slow response angular displacement of said part, means for summing connected to receive said first signal and producing a summed output, means for receiving said summed output and for attenuating high frequencies therein, said last named means providing an error compensation signal, means adapted to be mounted on said part for sensing rotational motion thereof, said last named means producing a second signal representing a fast response indication of angular displacement of said part, means for combining said error compensation signal and said second signal and for providing a combined signal, means for feeding back said combined signal to said means for summing, said first signal and said combined signal having opposing sense for the same motion sense, whereby steady state errors in said second signal are compensated in said combined signal by said error compensation signal and transients in said second signal appear in said combined signal.

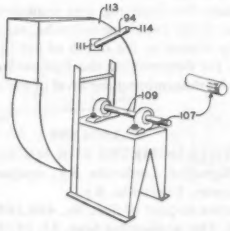


3,974,700

TECHNIQUE AND APPARATUS FOR BALANCING ROTATING MEMBERS

Gene H. Webb, 848 Baird St., Akron, Ohio 44306

Filed Sept. 5, 1974, Ser. No. 503,257
Int. Cl.² G01M *1/32*; F04D *29/66*
U.S. Cl. 73—468 **11 Claims**



2. In a device rotatable about an axis, the improvement for dynamically balancing said device, comprising:

a plurality of receptacles positioned about said axis adaptable for receiving balancing weights therein;

access means connected to each of said receptacles for providing access thereto for the receipt of said balancing weights, said access means comprising tubular channels in substantially parallel relation with said axis and extending in a curvate manner from said axis outwardly to said receptacles; and

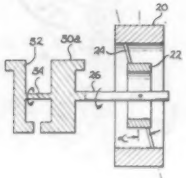
wherein said device is a horizontally mounted fan rotatable about a horizontal shaft and maintained within a sealed closure and wherein each of said tubular channels extends from a collar mounted on said shaft and through a shroud in sealing engagement with the casing and into weight-passing communication with the associated receptacle.

3,974,701

SPIN COUPLED, ANGULAR RATE SENSITIVE INERTIAL SENSORS WITH OPTIONAL ACCELERATION SENSING CAPABILITY AND METHOD OF FABRICATING SAME

Harold F. Erdley, Los Angeles, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 28, 1975, Ser. No. 608,770
Int. Cl.² G01P 9/02, 15/02
U.S. Cl. 73—504 48 Claims



1. Apparatus in a tuned inertial instrument for minimizing the effects of twice spin frequency angular disturbances of the shaft about axes which are orthogonal to the spin axis comprising:

a shaft means for rotation about a spin axis at a predetermined spin frequency;

a sensitive element;

a suspension means for coupling said sensitive element to said shaft, said suspension means including means for allowing relative oscillation between said sensitive element and said shaft about at least one suspension means axis, said suspension means axis being non-orthogonally disposed with respect to said spin axis by a predetermined angle; and

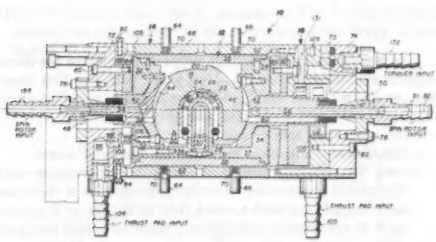
means coupled to said shaft for providing a product of inertia about said spin axis and an axis perpendicular to said spin axis.

3,974,702

FLUIDIC INERTIAL GYRO

Rolf K. Brodersen, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1975, Ser. No. 561,386
Int. Cl.² G01C 19/28, 19/12
U.S. Cl. 74—5.6 B 4 Claims



1. A continuous run, single axis, single degree of freedom, gas operated fluidic inertial gyro comprising

a. a housing having a cylindrical journal gas bearing section and end thrust gas bearings;

b. a gimbal assembly having a gimbal axis;

c. a turbine type spin rotor and means rotatably supporting the latter in said gimbal assembly;

d. said gimbal assembly including end caps cooperative with said end thrust bearings and a gas bearing sleeve cooperative with said housing journal gas bearing section to form gas seal means supporting said gimbal assembly within said housing;

e. said gimbal assemblies including also shaft means formed with passageways to channel input flow to and vent flow from said gas turbine type spin rotor along and/or parallel to said gimbal axis to minimize drift error;

f. a pickoff torquer ring fixed to said gimbal assembly within said housing and having vane type pickoffs and torquers;

g. said housing having torquer channels and nozzles to provide inputs to opposite sides of said torquer vanes to provide initial coarse gimbal adjustment and fine low level bias final correction;

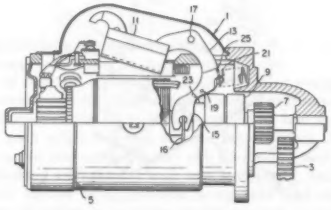
h. said housing having pickoff channels to provide analog gas pressure readouts of pounds per square inch convertible to angular deflection in degrees.

3,974,703

COMBINATION RETURN AND MESH SPRING-PLUNGER POLE MOTOR

Anthony John Strozinski, Horseheads, N.Y., assignor to Facet Enterprises, Inc. Motor Components Division, Elmira, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,744
Int. Cl.² F02N 1/00
U.S. Cl. 74—6 7 Claims



1. A starter drive adapted for use with an internal combustion engine and having a starting motor with a plunger pole, means for drivably connecting the starting motor to the engine for cranking the engine when the motor is energized including a lever arm connected to the plunger pole and a shift fork pivotally attached to the lever arm, and a single spring for moving the shift fork into cranking position when the motor is energized and for returning the shift fork and lever arm to non-cranking position when the motor is deenergized.

3,974,704

TUNER MECHANISM

Mitsuharu Sasano, Sagamihara, Japan, assignor to Toyo Musen Co. Ltd., Tokyo, Japan

Filed May 29, 1975, Ser. No. 581,878
Claims priority, application Japan, Nov. 6, 1974, 49-134364[U]
Int. Cl.² F16H 35/18
U.S. Cl. 74—10.33 10 Claims

1. An improved tuner mechanism including:

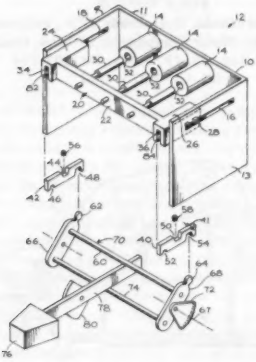
a coil frame having a back portion and a pair of side portions supported from and separated by said back portion, each of said side portions having a guide slot therein normal to said back portion;

a core frame slidably supported between said side portions of said coil frame and having a cross-bar and a pair of end pieces at opposite ends of said cross-bar, said end pieces each having a guide stub on the outer surface thereof slidably engaging a respective one of said guide slots, each of said end pieces having, in addition, a slit therein parallel to an adjacent one of said side portions, said slit forming top and side walls in each of said end pieces;

a cylindrical pin supported in at least one of said side walls in each of said slits in a direction parallel to said cross-bar and movable in concert with said core frame;

a transfer frame supported rotatably between said end portions with its axis of rotation parallel to said cross-bar and having end plates interconnected by motion transfer rods, said end plates having rounded projections at corresponding ends therof, said transfer frame being supported with said rounded projections slidably positioned within respective ones of said slits;

a coupling member coupled between said transfer frame and said core frame for transferring motion therebetween, said coupling member having first and second lower tapered notches and an upper tapered notch, and being positioned in each of said slits with each of said first lower notches engaging one of said rounded projections and each of said second lower tapered notches engaging one of said cylindrical pins;



a spring positioned within each slit and having one end thereof in urging engagement with said upper wall of said slit and having the other end thereof in urging engagement with said upper tapered slot in a respective one of said coupling members, whereby each of said coupling members is urged into firm contact with one of said cylindrical pins and a corresponding one of said rounded projections and error in the positioning of said core frame by said transfer frame arising from mechanical tolerances in said coupling member are substantially eliminated; and

transfer frame orienting means movable into engagement with said transfer rods for positioning said transfer frame and thereby, through said spring urged coupling member, accurately positioning said core frame.

3,974,705

MECHANISM FOR MOVING SLIDES IN MACHINE TOOLS

Theodor Wittkamp, Bielefeld, Germany, assignor to Gildemeister Aktiengesellschaft, Bielefeld, Germany

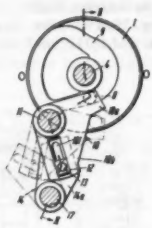
Filed July 26, 1974, Ser. No. 493,991

Claims priority, application Germany, Aug. 2, 1973, 2339190

Int. Cl.² F16H *21/42, 21/50, 37/12*

U.S. Cl. 74—53 **10 Claims**

1. Mechanism for moving components in machine tools, particularly for reciprocating cross slides in automatic machines, comprising a first lever pivotable about a first axis and having a first arm; a second lever pivotable about a second axis and having a second arm, one of said arms constituting a yoke having a first elongated slot and the other of said arms having at least one second elongated slot; a sliding block extending into and being freely movable lengthwise of said first slot, said block having a carrier extending into and movable lengthwise of said second slot; means for releasably locking said carrier to said other arm; cam and follower means for pivoting said first lever whereby said first lever pivots said second lever through the medium of said block; and means for



transmitting motion from said second lever to a machine component.

3,974,706

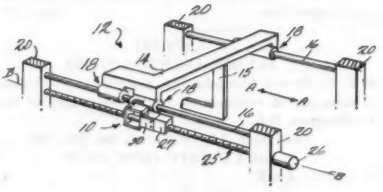
LEAD SCREW COUPLING ASSEMBLY

Joseph O. Danko, Jr., Baltimore, Md., assignor to Danko-Arlington, Inc., Baltimore, Md.

Filed July 23, 1975, Ser. No. 598,387

Int. Cl.² F16H *29/20*

U.S. Cl. 74—89.15 **18 Claims**



1. In a combination including apparatus mounted for linear reciprocal guided movement along a first path in a first direction, an assembly for moving said apparatus in said first direction along said first path, said assembly comprising

a rotatable lead screw,

a threadable connection mounted on said lead screw,

means for rotating said lead screw to reciprocate said threadable connection mounted thereon in a direction substantially parallel to said first direction in a second path of movement, substantially parallel to said first path of movement, and

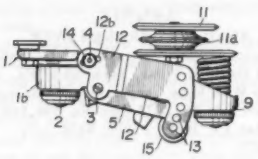
means for connecting said threadable connection to said apparatus for preventing twisting movement or movement parallel to said first direction of movement of said threadable connection relative to said apparatus along the whole of said first and second paths of movement, but allowing limited movement of said threadable connection relative to said apparatus in directions transverse to said first direction along the whole of said first and second paths of movement, so that wear on said threadable connection will be minimized when force components in said transverse directions are exerted due to small deviations in parallelism of said first and second paths.

3,974,707

DERAILLEUR FOR A BICYCLE

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Japan

Filed Mar. 13, 1975, Ser. No. 557,989
Claims priority, application Japan, Aug. 3, 1974, 49-89314; Sept. 6, 1974, 49-103137; Aug. 6, 1974, 49-90447; Oct. 12, 1974, 49-117481; Oct. 23, 1974, 49-122954
Int. Cl.² F16H 7/22, 7/00
U.S. Cl. 74—217 B 25 Claims



23. A derailleur for a bicycle which is pulled by control wires to move cages having two chain guide pulleys to move a driving chain to a selective sprocket of a freewheel to change the speed of the bicycle, said derailleur comprising;

a. four members including a first fitting member, second and third linkage members each pivotally mounted at one end to said fitting member, and a fourth movable member pivotally mounted at one end to each other end of said linkage members, said linkage members being swingable with respect to said fitting member, said fourth movable member being swingable with respect to said fitting member and to said linkage members, said fourth movable member at its other end being connectable to the cages;

b. means, connected to at least one of said four members, for maintaining the position of the cages; and

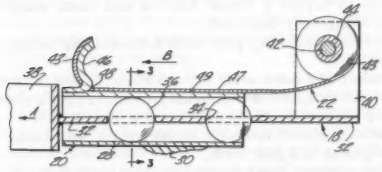
c. means, between said fitting member and another of said four members movable with respect to each other, for moving said fourth movable member, including two control wires, a movable plate having two arms respectively retaining terminals of said wires, and a plate fixed to said fitting member and opposite said movable plate, said fixed plate having means for guiding said wires to said movable plate.

3,974,708

CONSTANT FORCE BELT TENSIONER

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 17, 1975, Ser. No. 614,282
Int. Cl.² F16H 7/12, 7/10
U.S. Cl. 74—242.1 A 10 Claims



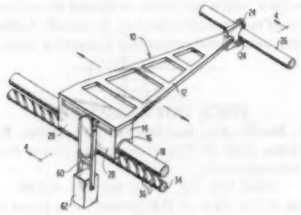
1. In a power transmission system comprising a drive pulley, a driven pulley, and a power-transmitting belt trained around said pulleys: the improvement comprising means for maintaining the belt in a taught condition irrespective of changes in belt length or belt wear; said improved means including a belt-engaged idler pulley means capable of bodily displacement across the belt path, a stationary support means, and a zero rate spring means trained between the idler pulley means and stationary support means to maintain a constant predetermined displacement force throughout the permissible range of idler pulley positions.

3,974,709

SCREW AND FOLLOWER POSITIONING DEVICE

Norma M. Janson, Hopewell Junction, and Carl Yakubowski, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,105
Int. Cl.² F16H 27/02, 25/22
U.S. Cl. 74—424.8 A 3 Claims



1. A positioning device comprising:

a rotatable lead screw having helical threads;

a pair of opposed rollers disposed in meshing engagement simultaneously with the helical threads of said screw; and

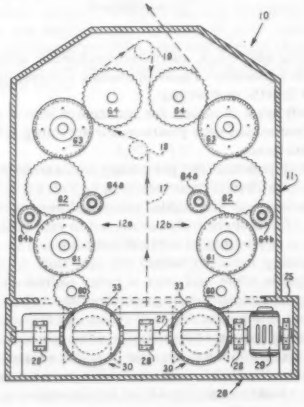
roller carrier means for rotatably supporting said rollers so that each roller has two degrees of rotational freedom relative to said carrier means and for holding said rollers in meshing engagement with said lead screw, said roller carrier means being movable along said lead screw in either direction in response to the rotation of said lead screw.

3,974,710

GEAR DRIVE FOR ROTARY PRESS AND THE LIKE

Wallace H. Granger, deceased, late of Kentfield, Calif., by Nina Kathryn Granger, executrix, 106 Cypress Ave., Kentfield, Calif. 94904

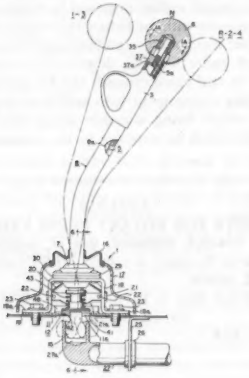
Filed June 2, 1975, Ser. No. 582,804
Int. Cl.² F16H 55/06
U.S. Cl. 74—465 8 Claims



1. A roller gear comprising:

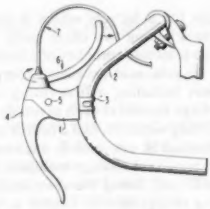
a. a circular disc having sockets formed uniformly in its periphery;
b. a pair of sideplates on opposite sides of the disc and secured thereto by means acting to force the sideplates inwardly toward the disc with an adjustable and resilient force, said plates being formed with outwardly tapering mounting holes arranged in pairs, with each pair consisting of a mounting hole in one sideplate and a mounting hole in the other sideplate, the members of such pair of mounting holes being in axial alignment with a peripheral socket of said disc;
c. a roller mounted in each said peripheral socket and having outwardly tapering end portions mounted in the respective mounting holes, said rollers having longitudinal axes which, when the roller is seated in and contacts the bottom of its respective socket, is radially farther outward than the axis of the respective mounting holes.

3,974,711
STICK SHIFT ASSEMBLY
George H. Hurst, Jr., Jenkintown, and James F. Hobbins, Philadelphia, both of Pa., assignors to Hurst Performance, Inc., Warminster, Pa.
Filed Jan. 20, 1970, Ser. No. 4,208
The portion of the term of this patent subsequent to May 20, 1986, has been disclaimed.
Int. Cl.² G05G *9/12, 5/10*
U.S. Cl. 74—473 R **6 Claims**



1. A gear shift stick assembly mechanism adapted to be coupled to a plurality of gears including reverse, first, second, third and fourth, comprising:
a. a shift stick mounted for movement into a plurality of predetermined gear positions for actuating selected ones of said gears;
b. first stop means for preventing movement of said shift stick into reverse gear position;
c. a hat-shaped elevatable member disposed toward the base of and operatively connected to said stick, and movable to a plurality of vertical positions;
d. actuating means mounted on said shift stick manually engagable while said stick is being shifted and including a trigger mechanism disposed near the top of said stick;
e. second stop means disposed above said first stop means;
f. coupling means comprising a wire connected between said trigger mechanism and said hat-shaped elevatable member, to enable said elevatable member to be raised from a lower vertical position into an upper vertical position when said actuating means is raised and to be lowered in unison therewith, and urging means normally urging said elevatable member to said lower vertical position; and
g. wherein said first stop means cooperates with said elevatable member when in said lower position to prevent movement of said stick into said reverse gear position while permitting movement into selected other positions, and wherein said second stop means prevents movement of said stick into third and fourth gear positions when said elevatable member is raised to said upper position where it is clear of said first stop means and said stick is enabled to move into reverse, first and second gear actuating positions.

3,974,712
AUXILIARY BRAKE LEVER
Alan D. Kaufman, Williamsport; Arne M. Reistad, Jr., Philadelphia, and David J. Wilke, York, all of Pa., assignors to Pennsylvania Wire Rope Corporation, Williamsport, Pa.
Filed July 16, 1975, Ser. No. 596,169
Int. Cl.² B62K *23/06;* **B62L** *3/02*
U.S. Cl. 74—479 **6 Claims**



1. In a caliper-type brake operating system having a main brake lever pivotally connected to a housing, and an auxiliary brake lever wherein the auxiliary brake lever is operable independently of the main brake lever for operating the caliper brake actuating cable, the improvement comprising, said auxiliary brake lever being rotatably mounted on the main brake lever housing, cam means connected between the main brake lever housing and the auxiliary brake lever, whereby upon rotational movement of the auxiliary brake lever, the cam means imparts axial movement to the auxiliary brake lever to thereby actuate the brake cable.

3,974,713
MULTI-STROKE PARKING BRAKE CONTROL
Raymond F. Toohey, Lincoln Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed July 1, 1974, Ser. No. 484,894
Int. Cl.² G05G *1/14*
U.S. Cl. 74—512 **1 Claim**

1. A multi-stroke parking brake control having rotatably mounted means engaging a parking brake cable and constructed to impose a tensile load on said cable when said means is angularly displaced;
said means including gear teeth formed along an arc of a circle;
a brake pedal constructed to pivot about the axis of rotation of said means from a retracted position to a cable tensioning position by the application of a force thereto;
a driving pinion rotatably supported on said pedal and engaging said gear teeth;
a first one-way clutch operatively interposed between said driving pinion and said pedal;
said first one-way clutch being constructed to hold said driving pinion rotatably fast with respect to said pedal when said pedal is displaced from said retracted position to said cable tensioning position;
said first one-way clutch being constructed to not inhibit rotation of said driving pinion about its axis when said pedal is displaced from said cable tensioning position to said retracted position;

said first one-way clutch comprising a first drum shape element coupled to said driving pinion and a first helical spring coil disposed about said first drum shape element;

said first coil having one end secured to said pedal;

said first coil being constructed to grip said first drum element when said first drum element is rotated in one direction and to slidably engage said first drum element when said first drum element is rotated in the opposite direction;

a housing part and a holding pinion rotatably supported on said housing part;

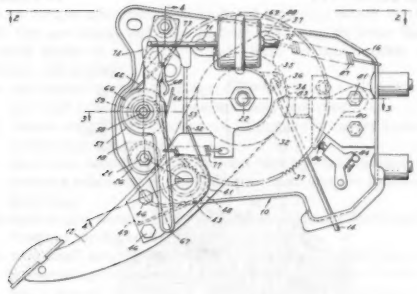
said holding pinion being in mesh engagement with said gear teeth;

a second one-way clutch operatively interposed between said housing part and said holding pinion;

said second one-way clutch being constructed to hold said holding pinion fast with respect to said part in response to a tensile load in said cable;

said second one-way clutch being constructed to not inhibit rotation of said holding pinion when said means is angularly displaced in a direction tending to impose a tensile load on said cable;

said second one-way clutch including a second drum shape element coupled to said holding pinion and a second helical spring coil disposed about said second drum shape element;



said second coil having one end secured to said housing;

said second coil being constructed to grip said second drum shape element when said second drum shape element is rotated in one direction and to slidably engage said second drum shape element when said second drum shape element is rotated in the opposite direction;

release means engageable with said second one-way clutch and constructed to disengage said second clutch from said holding pinion to permit said holding pinion to rotate freely in either direction;

said second coil having a free end;

said release means having a portion constructed to engage the free end of said second coil and to displace said second coil whereby said second drum shape element slideably engages said second coil when said second shape drum element is rotated in said one direction;

a retractor spring constructed to move said pedal from said cable tensioning position to said retracted position when said force is not applied to said pedal;

said first coil having a free end constructed to engage said housing part when said pedal is in said retracted position;

said first drum element being slidable with respect to said first coil when rotated in said one direction when said free end of said first coil is in engagement with said housing part.

3,974,714

PUMP DRIVING MECHANISM WITH ADJUSTABLE STROKE

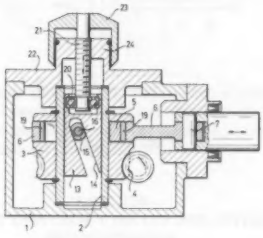
Horst Fritsch, Leonberg, Germany, assignor to LEWA Herbert Ott Kommanditgesellschaft, Leonberg, near Stuttgart, Germany

Filed Nov. 21, 1974, Ser. No. 525,975

Claims priority, application Germany, Oct. 1, 1974, 2446806

Int. Cl.² G05G *1/00*

U.S. Cl. 74—571 L **5 Claims**



1. A pump drive mechanism, such as a metering pump drive mechanism, designed to effect the transformation of the rotary motion of a drive wheel into an oscillating movement of a connecting rod, arranged at a right angle to the axis of the drive wheel comprising an eccentric disc mounted on said drive wheel; the stroke of the connecting rod being adjustable across the eccentric disc and positioned so as to be radially displaceable by control means adjusting the eccentricity of the eccentric disc, said radially moveable eccentric disc being mounted to a hollow shaft carrying a control shaft so that the eccentric disc and the hollow shaft cannot spin apart, said hollow shaft being only rotateably moveable in the housing of the drive mechanism and mounted to it bearing the drive wheel, said control means comprising a control shaft which can be coaxially moved to the drive wheel as well as to the eccentric disc by means of a control spindle connected thereto and a control element mounted to said eccentric disc and moving in an oblique slot defined in said control shaft obliquely inclined to the shaft axis; said control element shifting the eccentric disc radially/linearly upon axial displacement of the control shaft.

3,974,715

NULL AND GAIN ADJUSTMENT MECHANISM FOR HYDROSTATIC PUMPS AND MOTORS

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 9, 1974, Ser. No. 530,926

Int. Cl.² G05G *1/00*

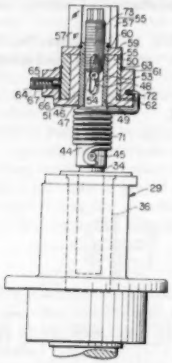
U.S. Cl. 74—571 R **15 Claims**

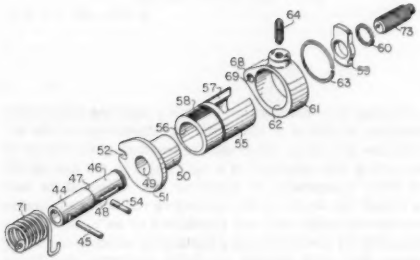
1. Adjustable control means for a rotatable servovalve comprising in combination:

a rotatable servovalve mounted for rotation about an axis;

a lever mounted for pivotal movement about said axis and adjustably connected to said servovalve for rotation of said valve upon pivotal movement of said lever about said axis, said lever including an arm extending away from said axis and link connecting means near the outer end of said arm for connecting actuating link means thereto and for defining with said axis the effective lever arm thereof;

first means for adjusting the angular position of said servovalve with respect to said lever; and,





second means for adjusting the effective lever arm of said lever.

3,974,716

METHOD AND ARRANGEMENT FOR EQUALIZING THE SPEEDS OF A PLURALITY OF ASYNCHRONOUS MOTORS JOINTLY DRIVING A SINGLE MACHINE, PARTICULARLY A MINING MACHINE

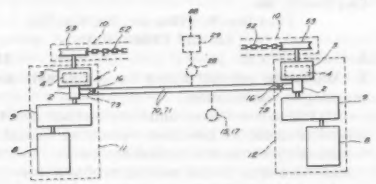
Egon Henkel, Essen, and Heinrich Wildförster, Gelsenkirchen-Buer, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Jan. 21, 1974, Ser. No. 435,382

Claims priority, application Germany, Jan. 24, 1973, 2303250

Int. Cl.² F16H *37/06*

U.S. Cl. 74—661 **15 Claims**



1. A combination comprising a single machine having a plurality of input shafts; a plurality of asynchronous drive motors each having a respective drive shaft; a plurality of differential gear arrangements each having an input shaft connected in force-transmitting manner to the drive shaft of a respective one of said motors, and each having a first and a second output shaft; means connecting the first output shaft of each differential gear arrangement in force-transmitting manner to a respective one of said input shafts of said machine; a plurality of hydrostatic speed converters each comprised of a rotor unit connected in force-transmitting manner to the second output shaft of a respective one of said plurality of differential gear arrangements, and each further comprised of a stationary housing unit, each of said hydrostatic speed converters having inlet and outlet conduits, and each being capable of operating either as a hydraulic motor or as a pump, with the inlet and outlet conduits of all the hydrostatic speed converters being connected together to equalize the pressure and flow in all of the hydrostatic speed converters.

3,974,717

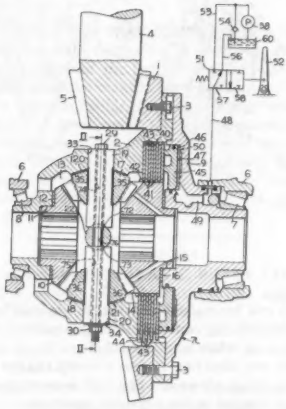
FOUR PINION DIFFERENTIAL

Michal A. Breed, Greenfield, and James E. Marsch, Brookfield, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 19, 1974, Ser. No. 534,554

Int. Cl.² F16H *1/40*, *1/44*

U.S. Cl. 74—713 **10 Claims**



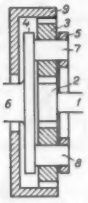
1. A differential for use on a vehicle comprising a one piece differential housing defining pinion shaft openings extending radially through said housing and a bearing surface for rotatably supporting said housing on one end, a coverplate fastened to the end of said housing defining a bearing surface for rotatably supporting said plate and housing, a ring gear fastened to said differential housing adapted for being driven by a drive pinion, a pair of side gears in said housing rotating on a common axis of rotation with said ring gear and differential, a plurality of pinion gears in said housing engaging said side gears, an integral shaft structure including, pinion shafts including a cross shaft extending diametrically through two of the openings in said housing supporting a pair of said pinion gears, a pair of stub shafts fixedly engaging the center of said cross shaft and extending radially from said cross shaft through two other of the opening in said housing and supporting a second pair of pinion gears, a bolt extending axially

through said stub shafts and diametrically through said cross shaft locking said cross shaft axially and retaining said shafts in fixed non-rotating positions in said housing thereby defining an integral shaft structure.

3,974,718
EPICYCLIC GEAR TORQUE ABSORBING PINION CARRIER

Gunnar Kylberg, Bromma, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Feb. 25, 1974, Ser. No. 445,535
Claims priority, application Sweden, Mar. 1, 1973, 7302867
Int. Cl.² F16H *3/44, 1/28, 57/00*
U.S. Cl. 74—750 R **2 Claims**



1. A torque absorbing carrier for the pinions which mesh with the sun-wheel and the internal gear ring to drive the co-axial shafts in an epicyclic gear train mounted within a housing comprising:

a. two spaced paralleled flanges between which said pinions and said sun-wheel are operationally mounted;

b. beams extending between said flanges for rigidly interconnecting the same;

c. shaft pins supporting said pinions between said flanges in meshing relationship with the sun-wheel and the internal gear ring;

d. one of said flanges being effective to transmit the torque moment produced by the co-axial shafts;

e. said shaft pins being resiliently mounted in said torque transmitting flange while being fixedly connected to the other one of said flanges thereby reducing deformation and axial distortion of the pinion shaft pins when subjected to the torque moment; and

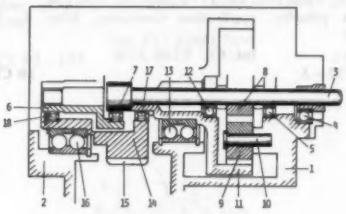
f. the shaft pin resilient mounting possessing the same load characteristics as the resilience of the beams whereby the shaft pins, when subjected to the torque moment, remain parallel to the co-axial shafts of the gear train regardless of the magnitude of the load resulting in the torque moment.

3,974,719
MECHANICAL POWER TRANSMISSION ASSEMBLY

Gosta Ador Evert Tiliander, Malmo, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Apr. 2, 1975, Ser. No. 564,274
Int. Cl.² F16H *5/52, 37/06, 57/10;* **F02N** *15/00*
U.S. Cl. 74—810 **1 Claim**

1. A power transmission assembly of the kind defined herein, including three power trains (i.e. three paths through which power can be transmitted) characterized in that the first of said power trains comprises said power input shaft and a first one-way clutch able to transmit torque only in one direction from the power input shaft to a first power take off device, that the second of said power trains comprises said power input shaft and a reduction gear and a second one-way clutch able to transmit torque only in one direction from the power input shaft to a second power take-off device, and that the third of said power trains comprises the said second power take-off device and a third one-way clutch able to transmit torque only in one direction from the said second power take-off device to the said first power take-off device wherein the reduction gear comprises a gear wheel secured to the



power input shaft and meshing with planet wheels rotating about stationary pivot pins, the planet wheels mesh with teeth in a sleeve, and the second one-way clutch acts between the sleeve and the second power take-off device.

3,974,720
DOWNSHIFT CONTROL CIRCUIT FOR HYDRAULIC TRANSMISSION

Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Apr. 4, 1975, Ser. No. 565,117
Claims priority, application Japan, Apr. 25, 1974, 49-45971
Int. Cl.² B60K *41/04*
U.S. Cl. 74—866 **6 Claims**

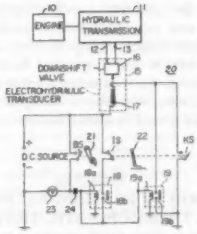
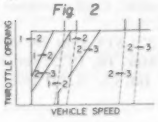


Fig. 2



1. A downshift control circuit for a road vehicle hydraulic transmission having a brake pedal, an accelerator pedal, and an electrohydraulic transducer including an electromagnet and a downshift valve operated by said electromagnet, means connecting the downshift valve hydraulically to said transmission for supplying thereto hydraulic shifting pressure, the downshift control circuit comprising a normally open switch operatively connected to the brake pedal, a normally closed switch operatively connected to the accelerator pedal; self-holding means comprising a self holding element energized upon operation of said normally open switch and released upon operation of said normally closed switch, said self-holding means including means coupling said electromagnet to a D.C. source to energize same while said self-holding element is energized to thereby supply said hydraulic shifting pressure to said transmission, whereby a shifting point moves to a higher speed to effect a downshift to the next lower speed.

3,974,721

MULTIPLE-SPINDLE MACHINE TOOL

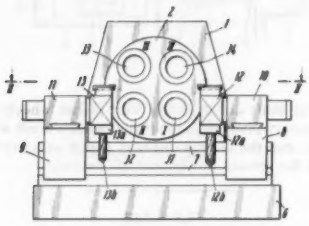
Erhard Schalles, Ubbedissen; Werner Latten, Oerlinghausen, and Reinhard Stender, Sennestadt, all of Germany, assignors to Gildemeister Aktiengesellschaft, Bielefeld, Germany

Filed Feb. 28, 1975, Ser. No. 554,320

Claims priority, application Germany, Mar. 1, 1974, 2409773

Int. Cl.² B23B 3/34

U.S. Cl. 82—3 10 Claims



1. A machine comprising the combination of a frame having first and second work stations; first and second work spindles mounted on said frame in said first and second stations, respectively, and having respective first and second workpiece-holding chucks defining respective first and second working axes lying in said first and second stations respectively; an elongated guide on said frame extending past said first and second stations and equispaced from said first and second axes; a pair of tool holders independently displaceable along said guide; and means for displacing said holders independently of each other for positioning each of said holders in either of said stations, whereby a workpiece in either station can be worked by a tool in either holder.

3,974,722

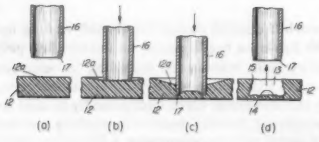
METHOD OF FORMING RECESSES IN THERMOPLASTIC TRAY

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 371,819, June 20, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,135

Int. Cl.² B26D 3/00

U.S. Cl. 83—1 1 Claim



1. A method for the formation of a liquid retaining recess in the bottom support surface of a foamed thermoplastic food tray which comprises, sequentially, (a) compressing said surface with a hollow punch member; (b) penetrating said compressed surface with said punch thereby forming a permanent recess in said surface and (c) removing said punch member from said recess, said recess being characterized by having a greater cross-sectional area at its base portion than at its top portion.

3,974,723

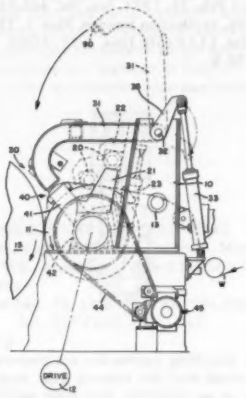
APPARATUS FOR CUTTING A WEB OF SHEET MATERIAL

Robert G. Erdody, Wilmington, Del.; Paul E. Harmon, and Richard S. Tetro, both of Fulton, N.Y., assignors to The Black Clawson Company, Middletown, Ohio

Filed June 20, 1974, Ser. No. 481,203

Int. Cl.² B26D 7/14

U.S. Cl. 83—18 4 Claims



1. The method of cutting a web material while limiting the portion thereof subjected to tension during cutting to a predetermined short length, comprising:

a. engaging said web with the blade of a cutting knife at a predetermined first location,

b. seizing said web at a location spaced downstream thereof a predetermined short distance from said first location which corresponds to said predetermined short length, and

c. stretching the resulting isolated short portion of said web between said locations until said web is severed by said cutting knife.

3,974,724

BAND SAW SAFETY GUARD

Jesse L. Shadle, West Chicago, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

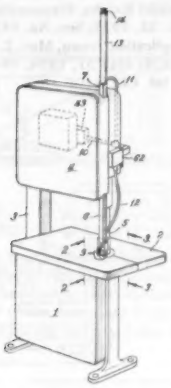
Filed May 14, 1975, Ser. No. 577,604

Int. Cl.² B26D 1/46, 7/24

U.S. Cl. 83—68 20 Claims

1. A safety guard system for a band saw machine having a saw blade and supporting structure, comprising, in combination, an elongated barrier mounted vertically in said structure for vertical reciprocation along in front of said blade, and means for raising or holding in fixed position or permitting the gravity lowering of said barrier responsive to the elevation of the undulating top surface of a workpiece as it approaches said saw blade; said means comprising single acting pneumatic cylinder means connected with said barrier for elevating the same, a control head mounted at the bottom end of said barrier, said control head comprising a valve body having an air passageway therethrough opening to the atmosphere, means for continuously supplying air under pressure to said air passageway with connection to said pneumatic cylinder means, valve means arranged in said body to vary and control the rate of flow of air through said passageway, and cam follower means mounted at the bottom of said control head in operative connection with said valve means to restrict the flow of air through said passageway proportionately to the degree and direction of movement of said cam follower means to thereby

modulate the air flow to and from said pneumatic cylinder means, said cam follower means being adapted to ride upon



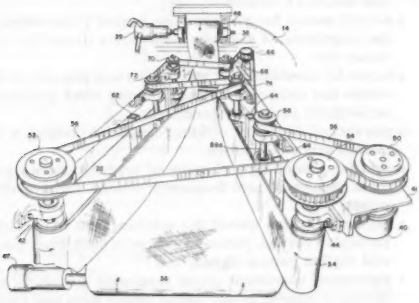
the top surface of a workpiece as it approaches said saw blade and move with changing elevation of said surface.

3,974,725

HIGH VOLUME CUTTER FOR ELONGATE FOOD PRODUCTS

Vernie A. Boots, Belle Glade, Fla., assignor to A. Duda and Sons, Oviedo, Fla.

Filed July 8, 1974, Ser. No. 486,311
Int. Cl.[2] B26D 1/28, 7/06
U.S. Cl. 83—100 8 Claims



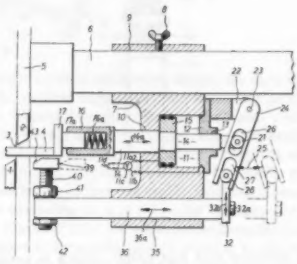
1. A machine for cutting up elongate vegetables on a rapid, high volume basis comprising a first endless moving belt of substantial length, at a first location on which belt, vegetables to be cut or sliced can be deposited for transport to a second location, second and third endless moving belts of similar length disposed adjacent the sides of said first belt and serving to keep vegetables supported by said first mentioned belt from falling off the edges thereof, said second and third belts being disposed in a converging relationship in the direction of movement, so as to narrow the width of the space in which vegetables residing on said first belt can be accommodated, an upper endless moving belt extending over at least part of the length of said first belt and serving with said second and third belts to compress the vegetables on said first belt into a closely packed mass by the time the second location has been reached, and a rapidly rotating cutter blade means operative adjacent said second location for acting upon and slicing the vegetables compressed by said belt array.

3,974,726

CUTTER FOR BAR STOCK

Bernd Stursberg, Ennepetal, Germany, assignor to Rolf Peddinghaus

Filed Oct. 21, 1975, Ser. No. 624,437
Claims priority, application Germany, Oct. 29, 1974, 2451290
Int. Cl.[2] B26D 7/16
U.S. Cl. 83—157 13 Claims



1. A cutter mechanism for cutting the ends off bar stock or the like comprising in combination:

a cutting station with a cutter operable to cut end pieces from a length of bar stock advanced incrementally to move the piece to be cut into the cutting station;

a vertical support movable laterally between a support position beneath said station and a release position laterally away from the station with said support vertically clear of the station and said release position;

a stop member movable laterally between a stop position adjacent the cutting station where said piece abuts the stop member and a release position laterally away from said piece;

said member and support having substantially parallel movement;

and a common drive means connected to said support and to said stop member for simultaneous movement thereof.

3,974,727

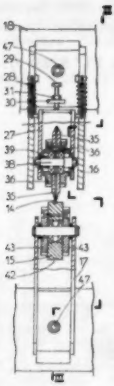
ROTARY KNIFE, ASSEMBLY AND MACHINE FOR PROCESSING A PRODUCT

Hubert Stehlin, Caluire, France, assignor to S.A. Martin, Saint-Priest, France

Filed Apr. 22, 1975, Ser. No. 570,496
Claims priority, application France, June 12, 1974, 74.20284
Int. Cl.[2] B26D 1/22
U.S. Cl. 83—174 6 Claims

1. A rotary knife for cutting a product as it is moved past the knife and supported by an opposing part, the knife comprising: a pair of identical circular half-knives of an asymmetrical cross-section, each half-knife having one first face defining a cutting angle and an opposed second face, said half-knives being arranged with their second faces in contact; means for urging said half-knives together to maintain said second faces in contact under pressure; and independent driving members connected to each half-knife for independent rotation, said

members being adapted to rotate each of said half-knives at slightly different angular speeds, such that there is relative



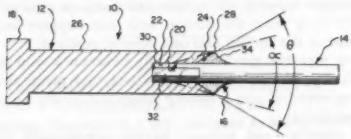
rotation between said half-knifes, which is substantially less than either of the angular speeds.

3,974,728

MULTI-PART PUNCH

Alton G. Herlan, Cheektowaga, N.Y., assignor to Pivot Punch Corporation, Lockport, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,727
Int. Cl.² B26F 1/14
U.S. Cl. 83—686 **3 Claims**



1. A punch comprising in combination:

a heat hardened steel body portion, said body portion having a generally cylindrical outer wall and a concentrically arranged cavity opening through its working end, said cavity including a conical end opening portion and a cylindrical base portion, said conical end opening portion defining a total cone angle of between about 30° and 60°, said base portion defining a flat transversely extending end abutment wall;

a cylindrical punch element formed of a hard abrasive resistant material, said punch element having one end press fit received within said base portion in face-to-face abutting engagement with said abutment wall and having an opposite punch end protruding from said cavity axially beyond said working end; and

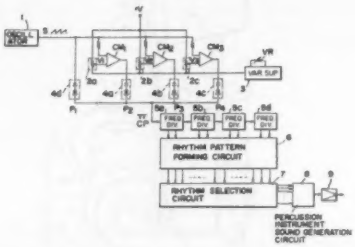
a bonding-vibration damping material filling said cavity between said body portion and said punch element and defining a concave fillet encircling said punch element immediately beyond said working end, said bonding-vibration damping material being relatively elastic as compared to said body portion and providing a bond between said body portion and said punch element throughout the range of punch operating temperatures.

3,974,729

AUTOMATIC RHYTHM PLAYING APPARATUS

Masahiko Koike, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 25, 1975, Ser. No. 552,732
Claims priority, application Japan, Mar. 2, 1974, 49-24679; Mar. 2, 1974, 49-24678; May 31, 1974, 49-63008[U]
Int. Cl.² G10F 1/00
U.S. Cl. 84—1.03 **8 Claims**



1. An automatic rhythm producing apparatus comprising:

means for generating clock pulses with an irregular pulse period comprising:

means for generating periodic saw-tooth waves;

a plurality of first means for generating an output pulse whenever the magnitude of said saw-tooth waves exceeds a reference level for each of said generating means;

a source of variable voltage;

a plurality of means for setting said reference levels for each of said first generating means, said setting means being coupled to said source of variable voltage and each of said reference levels varying in response to variations in said source of variable voltage;

a second means for generating an output pulse whenever the magnitude of said saw-tooth waves drops to a zero value; and

a means for combining the pulses from said plurality of first means and said second means whereby clock pulses with an irregular period are generated;

a plurality of frequency dividing means for dividing in frequency said clock pulses;

means for generating a plurality of rhythm pattern signals upon receipt of said frequency divided variable clock pulses;

a rhythm selection circuit for selecting and outputting a particular rhythm pattern signal or signals from among said rhythm pattern signals; and

a percussion instrument sound generation circuit for producing in resonse to said output signals from said rhythm selection circuit, a desired rhythm sound signal.

3,974,730

GUITAR STRUT ASSEMBLY

Andrew Borden Adams, Jr., 8700 MacArthur Blvd., Bethesda, Md. 20034

Filed Aug. 8, 1975, Ser. No. 603,031
Int. Cl.² G10D 3/00, 1/08
U.S. Cl. 84—291 **21 Claims**

20. A guitar comprising a body, said body comprising:

an apertured face,

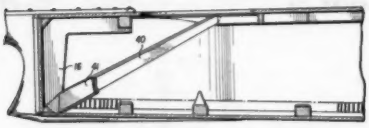
a back spaced from said face,

a rim interconnecting said face and said back, and

bracing means, said bracing means comprising:

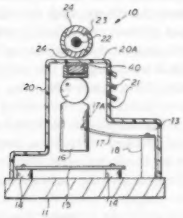
a pair of cross braces secured to the interior surface of said face and arranged as a cross with an arm of one of said cross braces disposed to one side of the aperture in said face and an arm of the other of said cross braces disposed to the other side of the aperture in said face,

and the point of intersection of said cross braces lying between the aperture in said face and the tail of the body, and



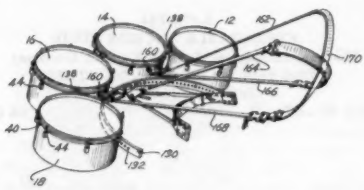
at least one strut, said strut having one end secured to the arm of one of the cross braces, said strut extending from its securement at its one end in a direction toward the head of the body and from said face toward said back and having the other end thereof secured to the body.

3,974,731
MUSICAL TOY
John Joslyn, Rayview Ave., Sag Harbor, Long Island City, N.Y. 11963
Filed Dec. 30, 1974, Ser. No. 537,260
Int. Cl.² G10D *13/08*
U.S. Cl. 84—404 **9 Claims**



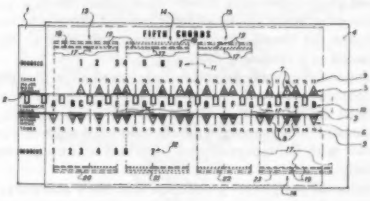
1. A musical toy comprising:
a base member,
a plurality of tone bars mounted on said base member,
a hammer disposed in striking relationship to each of said tone bars,
means for resiliently supporting each of said hammers in striking relationship to its corresponding tone bar for movement toward and away from said corresponding tone bar,
an actuator means moveably mounted adjacent said hammers,
said actuator means and hammers including complementary magnetic means which when the actuator means is moved relative to said hammer means creates a magnetic influence on the adjacent hammer which causes the hammer to strike its corresponding tone bar,
wherein said actuating means includes a slide bar mounted on said base member in spaced relationship to said hammers,
and a slider slideably mounted on said slide bar for movement transversely relative to said hammers whereby said hammers are sequentially actuated as said slider slides pass said hammers.

3,974,732
MULTIPLE MUSICAL INSTRUMENT HOLDER FOR MARCHING
Ralph C. Kester, Jr., 1531 20th Ave., Lakeworth, Fla. 33460
Filed Mar. 31, 1975, Ser. No. 563,576
Int. Cl.² G10D *13/02*
U.S. Cl. 84—421 **8 Claims**



1. A multiple musical instrument holder for marching, comprising an instrument support section including an elongated, horizontally disposed member having the outer ends thereof extending rearwardly and having a plurality of laterally spaced instrument support stations for holding a plurality of percussion instruments in playing position, a forwardly projecting means connected at its forward end to said instrument support section and extending to a position for engagement with the body of the marcher near the waist for holding the instrument support section in forwardly spaced relation to the marcher's body, and shoulder harness for the marcher for supporting the forward end of said projecting means and the instrument support section in a desired position relative to the body of the marcher.

3,974,733
FIFTH CHORDS INDICATING AND MUSIC TEACHING DEVICE
Georges A. Cournoyer, 480 Chapman St., St. Bruno, Quebec, Canada
Filed Dec. 20, 1974, Ser. No. 534,910
Int. Cl.² G09B *15/02*
U.S. Cl. 84—473 **6 Claims**



1. A fifth chords teaching and indicating device comprising a base member, a second and a third members both movably connected to said base member and independently movable relative to the latter, a chromatic scale having the musical notes equidistantly marked on one face of said second member and displaceable endwise relative to said base member, one diatonic scale marked on said base member laterally adjacent to said chromatic scale, one row of degree marks extending on said base member along said diatonic scale and including a code distinctively identifying the fifth chord of which qualification, as diminished, augmented, major and minor, can be played on any of the corresponding degrees of one octave of the chromatic scale, and at least one fifth chord indicator marked on said third member laterally adjacent said row of degree marks, displaceable with the third member along the chromatic scale, and including pointers of distinc-

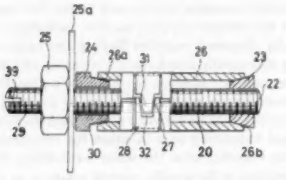
tive notes of said one fifth chord pointing toward the chromatic scale and forming dividers located at the specific degrees of the ends of the component thirds of the fifth chord, and a qualification code distinctively identifying the qualification of each of said component thirds as a diminished, augmented, major or minor.

3,974,734

EXPANDABLE ANCHOR STUD

Fritz Mächtle, Jahnstrasse 4, 7015 Korntal, Germany

Filed June 14, 1974, Ser. No. 479,500
Int. Cl.² F16B 13/06
U.S. Cl. 85—67 16 Claims



1. An anchor stud adapted for insertion into, and clamping attachment against a cylindrical bore, the anchor stud comprising:

a central threaded member defining a longitudinal axis and a front and rear end of the stud said rear end having tool engaging means thereon, whereby said front end is adapted to be inserted into said cylindrical bore;

a pair of oppositely tapered expansion plugs arranged on the threaded member in a concentric, axially spaced relationship near its front and rear ends, the respective tapers of said plugs converging toward each other, the rear expansion plug being axially slidable on said threaded member means for causing the front expansion plug to be displaced in a rearward direction;

an expandable shell assembly comprised of a plurality of separate arcuate shell segments of equal length mounted about the stud with the front and rear expansion plugs at opposite ends thereof, whereby said shell segments cooperate with the tapers of said front and rear plugs, respectively;

an external peripheral groove on said shell assembly, said groove having a broad and shallow rectangular cross-section;

said groove being located axially closer to the rear end of said shell assembly than to the front end of said shell assembly;

a coiled spring means positioned within said groove surrounding and radially retaining the segments of said expandable shell assembly; and

means on said rear expansion plug for limiting axial displacement and radial expansion of said shell assembly at the rear expansion plug;

whereby the off-center location of said groove prevents rearward shifting and premature expansion of said shell assembly during insertion,

whereby said spring member assures maintaining a concentric arrangement of said shell segments during handling, and

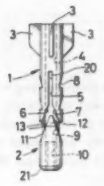
whereby non-uniform expansion and distribution of clamping force is achieved.

3,974,735

ANCHORING DEVICE FOR SCREWS

Albert Berner, Weckrain 7, 7118 Kunzelsau, Germany

Filed Dec. 10, 1974, Ser. No. 531,307
Int. Cl.² F16B 29/00
U.S. Cl. 85—72 4 Claims



1. In an anchoring device for use with wood or machine screws consisting of a generally cylindrical casing in the form of a slitted expansion dowel and an associated, also generally cylindrical, expansion body which is axially displaceable towards the casing by means of a screw that engages the expansion body, in the manner of a nut which is prevented from rotating, for the purpose of expanding the casing in a radial direction, the casing and the expansion body being crossed by axial hollow chambers, and the slits in the casing extending over a region of the casing facing towards the insertion end, and the expansion body comprising suitable wedge-shaped faces to enable it to engage in the slits provided in the casing and thus to press them apart when the expansion body is tightened by means of the screw, the casing and the expansion body both consisting of plastic material and being connected together in the unused state by a connection means which is easily broken by the axial movement of the expansion body when it is tightened by the screw, the improvement which comprises:

said casing, wherein each slit formed therein has a closed end formed by a radially extending, inclined surface of said casing, a first portion adjacent the closed end of each slit defined by substantially parallel, longitudinally extending surfaces of said casing, and a second portion adjacent said first portion defined by surfaces of said casing which are longitudinally divergent in the direction of the insertion end of the casing so as to widen an open end of the slit at the insertion end of the casing; and

said expansion body, which includes longitudinally extending, wedge-shaped tabs formed on a rear portion of the expansion body, the lateral end faces of each tab being oppositely inclined with respect to one another and forming said wedge-shaped faces for enabling the expansion body to engage said casing within said slits, and said expansion body being axially spaced from, and secured to, said casing by said connection means so that an end portion of each tab projects toward the open end of a corresponding slit of the casing;

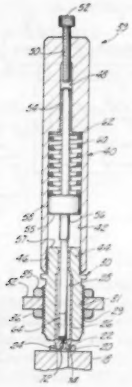
whereby, as the screw engaging the expansion body is turned in a direction to cause axial movement of the expansion body toward the casing, after the connection means is ruptured and the casing is expanded radially outwards by the engagement and movement of the wedge-shaped tabs within the slits, the wedge-shaped tabs are forcibly deflected radially outwards by the inclined surfaces of the casing which form the closed ends of the slits.

3,974,736

CARTRIDGE SHELL RELOADING TOOL

Anthony S. Minko, 18281 Oak, East Detroit, Mich. 48021

Filed Aug. 12, 1974, Ser. No. 496,585
Int. Cl.² F42B 33/02
U.S. Cl. 86—23 3 Claims



1. A reloading tool for resizing empty rifle and pistol metal cartridge shells of the type having end flanges formed at the butt ends thereof, said tool comprising a housing having a longitudinal bore; a die carried at one end of said housing bore, the other end of said housing bore having a threaded portion, said die having a longitudinal bore axially aligned with said housing bore; an anvil having means for slidably receiving the end flanges of said cartridge shell for holding said shell in axial alignment with said die bore; means moving said anvil relative to said die bore in a first direction such that one end of said die bore receives said cartridge shell to resize the same and in a second direction to forcibly withdraw said shell from said die bore, the other end of said die longitudinal bore opening into said housing bore; a spindle slidably mounted in said housing bore and having one end extending through said die bore for abutting engagement with the interior of the butt end of said shell; a coiled spring carried within said housing bore, said coiled spring having one end abutting a portion of said housing while the other end of said coiled spring abuts a portion of said spindle for urging said spindle into said abutting engagement with said shell butt end applying an additional force against said shell to aid said anvil in forcibly withdrawing said shell out of said die bore when said anvil is moved in said second direction; and a threaded member in said threaded portion of said housing longitudinal bore and adapted to engage the other end of said spindle for exerting a mechanical force on said spindle to eject said shell from said die bore.

3,974,737

SEMI-AUTOMATIC WEAPON-LOADING SYSTEM

Jean Georgel, and Maurice Vilain, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 5, 1974, Ser. No. 529,943
Claims priority, application France, Dec. 7, 1973, 73.43763
Int. Cl.² F41F 9/00
U.S. Cl. 89—1.802 10 Claims

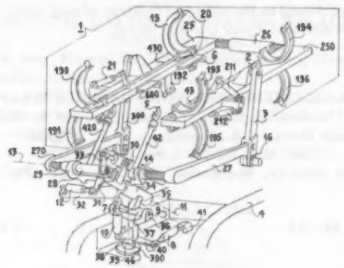
1. A semi-automatic loading system for a weapon having at least one launching ramp provided with at least one generally horizontal projectile-receiving surface, comprising:

a projectile holder including an elongate member having at least one generally horizontal projectile-carrying surface alignable with said projectile-receiving surface;

a carrier for said holder positionable adjacent said weapon;

mounting means supporting said holder on said carrier with freedom of independent rotation about three mutually orthogonal axes to facilitate a positioning of said member alongside said ramp;

releasable clamping means on said projectile-carrying surface for retaining a projectile to be transferred to said



projectile-receiving surface, said clamping means being pivotable about a swing axis parallel to a longitudinal edge of said member for delivering said projectile to said projectile-receiving surface; and

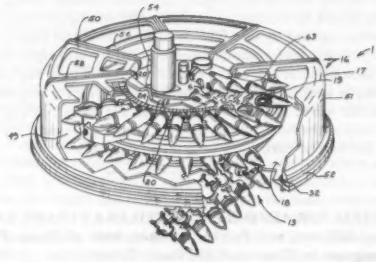
actuating means for pivoting said clamping means about said swing axis upon alignment of said surfaces with each other.

3,974,738

ROTARY DIFFERENTIAL AMMUNITION RESERVOIR

Elwyn A. Meyer, Granite City, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 9, 1974, Ser. No. 496,280
Int. Cl.² F41D 9/02
U.S. Cl. 89—34 18 Claims



1. In an ammunition transfer system for transferring ammunition from a magazine to a firing weapon, the improvement which comprises intermediate storage means for storing a number of rounds of ammunition, said number being substantially less than the number of rounds storable in said magazine, said storing means including a housing having a first upper stationary part and a second part rotatable with respect to said upper stationary part, said intermediate storage means including means for feeding the rounds into said intermediate storage means from said magazine at a first rate, means for feeding rounds to said firing weapon from said intermediate storage means at a second rate, and means for correlating said input and said output rates, said firing weapon feeding means being mounted to the second rotatable part of said housing, at upper transfer wheel having means for receiving a plurality of rounds formed in it, said upper transfer wheel receiving means being rotatably mounted to said housing, a lower transfer wheel

having means for receiving a plurality of rounds formed in it, said lower transfer wheel receiving means being rotatably mounted to said housing, and differential means mounted for rotation to said housing, said differential means being positioned intermediate said upper and said lower transfer wheels and being operatively connected thereto, said differential means including means for transferring rounds from said upper transfer wheel to said lower transfer wheel, and means for allowing said differential means to seek an azimuthal position proportional to the speed of rotation of said upper transfer wheel and said lower transfer wheel.

3,974,739

BELT AMMUNITION BOX FOR PORTABLE WEAPONS

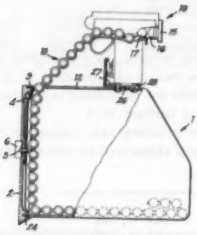
Maurice V. Bouriet, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A., Herstal-lez-Liege, Belgium

Filed Aug. 13, 1974, Ser. No. 497,074

Claims priority, application Belgium, Sept. 28, 1973, 805425

Int. Cl.² F41D 9/00

U.S. Cl. 89—34 **7 Claims**



1. A belt ammunition box for portable weapons of overall prismatic shape, characterized by the fact that its front face comprises of a tightly closed door which, together with a cut away portion of the upper surface of the box, bounds a passage for the belt of cartridges, aforesaid passage being, at the start, closed by a closing element made up of a platelet, a rigid member carried by one face of said platelet and fitting within said passage, and a dummy link carried by said rigid member for hooking onto one of the ends of aforesaid belt, said platelet having a width and a length which are greater, respectively, than the width and the length of the cut away portion in the top wall of the box and providing a gripping element for bringing the belt of cartridges in armed position.

3,974,740

SYSTEM FOR AIMING PROJECTILES AT CLOSE RANGE

Henri Billottet, and Patrice Fechner, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 14, 1972, Ser. No. 225,801

Claims priority, application France, Feb. 17, 1971, 71.05366

Int. Cl.² F41G 5/08

U.S. Cl. 89—41 SW **9 Claims**

1. A firing-control system for nonguided projectiles, comprising:

an array of tubular projectile launchers clustered about a main axis;

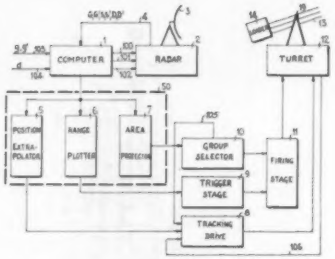
tracking means for ascertaining the general location of a target to be attacked;

computer means responsive to said tracking means for precalculating a presumed target position;

first drive means controlled by said computer means and operatively coupled with said array for maintaining said axis trained upon said presumed target position in directions diverging in at least one dimension, said array being divided into a plurality of groups of launchers, the launchers of each group having muzzles trained upon different parts of an assigned segment of a predetermined region of uncertainty centered on said presumed targer position;

trigger means operable by said computer means for actuating the launchers of a selected group within a predetermined firing period with simultaneous emission of projectiles from combinations of launchers within the group having their muzzles symmetrically distributed about said main axis for a balanced recoil effect; and

second drive means for rotating said array in another dimension at a rate enabling each group to sweep its assigned segment within said firing period.



3,974,741

BRAKE BOOSTER

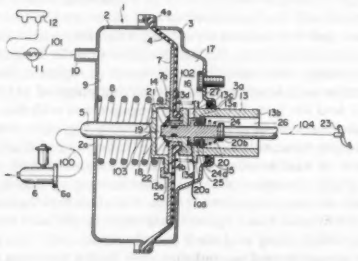
Atsushi Ohmi, Anjyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Apr. 18, 1975, Ser. No. 569,380

Claims priority, application Japan, Apr. 19, 1974, 49-44813

Int. Cl.² F15B 9/10

U.S. Cl. 91—376 R **5 Claims**



1. A brake booster unit having a housing comprising a front and a rear shell element detachably coupled with each other and a diaphragm mounted in the interior space of said housing for mechanical separation thereof into a variable volume vacuum chamber and a variable volume atmospheric pressure chamber, biasing means disposed within said vacuum chamber for normally urging said diaphragm to the direction toward which the volume of said atmospheric-pressure chamber is reduced, a sleeve member and a motion-transmitting rod concentrically arranged thereto, partially introduced, sealingly and movably into the interior of said atmospheric-pressure chamber, said unit being characterized by first valve, means formed between said rod and said sleeve for on-off control of fluid communication between said atmospheric-pressure chamber and ambient atmospheric pressure, said first valve means being kept at its closed position when the booster unit is in its non-operating position, second valve means including beaded inner periphery portion of said diaphragm which acts as a valve seat and a valving portion formed on said

sleeve and having a configuration for the prevention of radial displacement of said beaded periphery when the booster unit is maintained in its operating position and said second valve means is maintained at its closed position for interruption of fluid communication between said both chambers; and a backing member interposed between said biasing means and said diaphragm and slidable on an outer periphery of said sleeve for backing up said diaphragm.

3,974,742

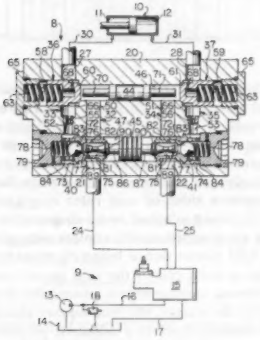
LOCK VALVE ASSEMBLY

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 31, 1974, Ser. No. 519,567

Int. Cl.² F15B *11/08, 13/042;* **G05D** *11/02*

U.S. Cl. 91—420 **11 Claims**



1. A lock valve assembly, for use in combination with a fluid circuit including a double acting hydraulic jack and a control valve for selectively directing fluid pressure to the opposite ends of such jack, comprising:

a valve body having first and second passage means formed therethrough for individually providing connection between the opposite ends of said jack and such control valve, said first passage means having a pair of separate high and low flow paths therein;

first and second check valve means disposed within said high and low rate flow paths, respectively, of said first passage means for normally blocking outlet fluid from said jack through such paths, each of said first and second check valve means being provided with a respective predetermined effective pressure responsive area exposed to outlet fluid from the jack for exerting an outlet fluid pressure responsive closing force on said first and second check valve means corresponding to their respective areas;

first and second actuator means responsive to inlet fluid pressure in said second passage means of the valve body, said second actuator means having an effective pressure responsive area open to inlet fluid pressure in said passage means greater than the said predetermined effective pressure responsive area of the second check valve means, said first actuator means having an effective pressure responsive area open to inlet fluid pressure in said second passage means less than the said predetermined effective pressure responsive area of first check valve means, said second actuator means being operative to exert an opening force on said second check valve means sufficient to overcome said closing force thereon when a predetermined positive inlet pressure exists in said second passage means so as to permit the exhausting of outlet fluid through said low rate flow path, and said first actuator means being operative to exert an opening force on said first check valve means sufficient to overcome said closing force thereon only when the inlet pressure exceeds the outlet pressure exerting said closing force thereon so as to permit the exhausting of outlet fluid through said high rate flow path.

3,974,743

FLUID ACTUATOR FOR A ROTATING ENGAGEABLE FRICTION DEVICE

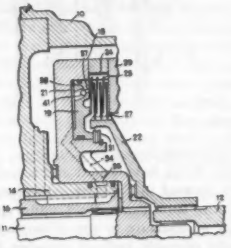
John S. Ivey, Hitchin, England, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 16, 1971, Ser. No. 171,934

Claims priority, application United Kingdom, Sept. 22, 1970, 44999/70

Int. Cl.² F15B *11/08, 13/04;* **F16D** *25/06*

U.S. Cl. 91—422 **1 Claim**



1. A fluid actuator comprising:

a rotating piston member having a piston axis;

biasing means for establishing said piston member normally in a disapply position;

a rotary housing member containing an annular pressure apply chamber for hydraulically controlling said rotating piston member which is movable axially, in response to fluid pressure in said apply chamber, from its disapply position to an actuating position;

means for introducing fluid pressure to said chamber to move said piston member axially to its actuating position and for subsequently exhausting fluid from said chamber to effect return of said piston member to its disapply position;

and a centrifugal pressure head release valve including an exhaust port, extending through one of said members and having a conical valve seat symmetrical around a seat axis, the larger end of which conical valve seat is adjacent said chamber, and a ball valve element which tends to move radially outward from said piston axis and along the radially outermost portion of said conical seat as a result of centrifugal force but is urged toward and held in said conical valve seat by fluid pressure in said chamber, thereby closing said port, when such fluid pressure is applied to said chamber,

said ball valve element being ejected out of said conical seat, by centrifugal force in the absence of such fluid pressure in said chamber, and opening said port to release any residual entrapped fluid from said chamber to prevent undesired false actuation of said piston member resulting from centrifugal force acting on such residual fluid.

said piston and seat axes being canted with respect to each other so that the angle between said piston axis and the radially outermost portion of said conical seat is substantially smaller than the angle between said piston axis and the radially innermost portion of said conical seat in order to effectively increase the centrifugal force otherwise required to unseat said ball valve element when fluid

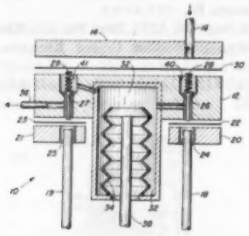
pressure is present, thereby increasing the maximum rotational speed at which said fluid actuator may operate.

3,974,744

ENGINES, OR PRIME MOVERS

John Henry Hedger, P.O. Box 357, Lakeside, Calif. 92040

Continuation of Ser. No. 336,027, Feb. 26, 1973, abandoned.
This application Dec. 4, 1974, Ser. No. 529,262
Int. Cl.² F15B 11/08, 13/04
U.S. Cl. 91—454 4 Claims



1. An improved engine comprising:

an engine block having first and second opposed sides;

a cavity formed in the first side of said engine block for confining a working fluid under pressure, said cavity having an aperture in one of its walls;

an axially movable bellows member having a plurality of inwardly directed corrugations positioned within said cavity, said bellows having an extended normal state and an aperture in one of its walls, the bellows aperture sealed to the aperture in said cavity by a sealing means thereby preventing escape of said working fluid from said cavity and providing an opening from the inner portion of said bellows member to the atmosphere;

means for introducing said working fluid into said cavity comprising an intake valve port within said engine block and open to said second side thereof, said port being disposed radially outwardly of said cavity, a first conduit from said valve port projecting exterior of said engine block, a second conduit postioned between said intake valve port and cavity and an intake valve positioned between the first and second intake conduits and having a spring for holding said intake valve in a normally closed position preventing flow into said cavity and operable to an open position against said spring for passing said fluid into said cavity and compressing said bellows member;

means for exhausting said working fluid from said cavity comprising an exhaust valve port within said engine block and open to said second side thereof, said port being disposed radially outwardly of said cavity, a first conduit from said exhaust valve port to said cavity, a second conduit from said exhaust valve port projecting exterior of said engine block and an exhaust valve positioned between said first and second exhaust conduits and having a spring for holding said exhaust valve in a normally closed position preventing the flow of said working fluid from said cavity and operable to an open position against said spring for exhausting said working fluid from said cavity and returning said bellows member to a normal state;

a rod member having a diameter substantially smaller than said apertures attached by attaching means to the inner end surface of said bellows member remote from said apertures projecting external of said engine block through said apertures, said rod member having a first direction of translation while said bellows member is compressing and a second direction of translation when said bellows member is returning to a normal state; and

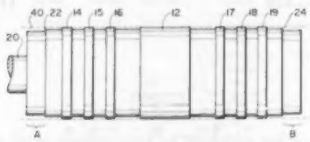
a valve cover plate positioned against said second side of said engine block and over said valve ports and secured to said block by securing means for sealing said valve ports from the atmosphere and supporting said valve springs.

3,974,745

PISTON FOR COMPRESSOR

Roland A. Godmaire, 224 St. Jacques St., Longueuil, Quebec, Canada

Filed July 30, 1973, Ser. No. 383,803
Int. Cl.² F01B 31/00; F16J 1/00
U.S. Cl. 92—127 5 Claims



1. In combination, a self-centering imperforate metal ring-type one-piece annular piston sleeve and a piston rod axially mounted through said sleeve, said sleeve being provided with a centrally positioned wide circumferential rider ring groove adapted to contain a rider ring therein and a plurality of piston ring grooves adapted to contain piston rings therein and disposed on opposite sides of said rider ring groove, the said sleeve and rod being adapted to be disposed in a cylindrical chamber of a gas compressor for compressing gas at both ends thereof, the said piston sleeve being characterized by a step-down portion at each end of the said sleeve constituted of a square-shouldered annular recess around the periphery of the end surface of the sleeve, the said square-shouldered recess defining, in cross-section, two adjacent perpendicular lines, one of said lines corresponding to the depth of the said recess is 0.01 inch within a tolerance less than ± 10% and the other of said lines is co-axial with the axis of the sleeve and is defined by the following formula:

$$L = \frac{8 \times D}{Wp + \frac{Wr}{2}}$$

wherein,

L = length of each step-down portion (inch) within a tolerance of ± 25%

D = outer diameter of the piston sleeve (inch)

Wp = weight of the pisto sleeve (pounds)

Wr = weight of the piston rod (pounds)

whereby, a compressed gas forwardly entering the said recess, under normal operation, abruptly hits the rear wall of the recess and provides a fluid cushion in said recess to permit the piston sleeve to slidedly float within the cylindrical chamber and maintain a concentric relationship.

3,974,746

MONO-SEAL PUMP PISTON

Senobio Campos, 24001 Muirlands, Space 72, El Toro, Calif. 92630

Filed May 5, 1975, Ser. No. 574,307
Int. Cl.² F16J 1/00, 1/12
U.S. Cl. 92—244 4 Claims

1. A mono-seal pump for mounting on a reciprocal piston rod, said piston comprising:

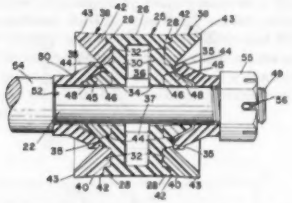
a piston rod;

a central-supporting hub having an outer circular wall, a pair of side walls, each of said side walls having a central

disposed opening therein aligned to receive said piston rod therethrough for removably mounting thereon;

a plurality of rib members extending outwardly from each of said side walls and integrally formed thereon;

a pair of resilient sealing rings, one of each being secured to oppositely disposed side walls of said central-supporting hub, said sealing rings having an annular wall inclined outwardly forming a sealing surface thereon, an inner annular wall central opening disposed therein being arranged for alignment with said central opening of said side walls, wherein



the inner annular wall of said opening in said sealing ring is inclined downwardly and outwardly to form an extended sealing surface for engagement with said piston rod, and wherein each of said sealing rings includes a plurality of slots therein to receive said rib members of said hub, whereby said rib members pass through respective slots; and

follower securement means connected to said piston rod and abutting the rib members which pass through the slots of said sealing rings.

3,974,747

MACHINE FOR MANUFACTURING SQUARE BAGS OF THERMOPLASTIC FILM

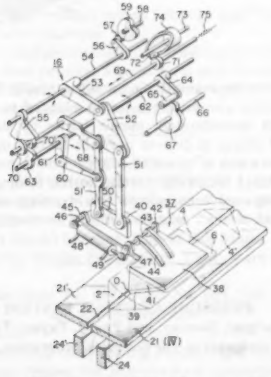
Yoshio Tsukino, Kashiwa, Japan, assignor to Dai Nippon Printing Company Limited, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 498,817

Claims priority, application Japan, Aug. 28, 1973, 48-96379; Aug. 28, 1973, 48-96381

Int. Cl.² B31B *1/84*

U.S. Cl. 93—8 VB **6 Claims**



1. A machine for manufacturing a square bag consisting of a flat tubular body made of thermoplastic film with the outer surface thereof processed to be hardly weldable and having its top opening closed by the use of a cover plate with a valve plate, said machine comprising:

a pair of elongated surface plates installed face to face with a slit therebetween, said plates being equipped with plural upper clamp mechanisms for holding said tubular body between said plates at fixed intervals therealong;

a conveying apparatus movable along said surface plates for conveying said tubular body along said slit, said conveying apparatus including plural lower clamp mechanisms for holding said tubular body positioned between said surface plates, whereby when the tubular body is held by the lower clamp mechanisms it is conveyed along the slit between the surface plates by forward movement of the conveying apparatus, and wherein the corresponding upper clamp mechanisms hold said tubular body when the tubular body is released from the lower clamp mechanisms so that the conveying apparatus returns to its former position;

means for opening the top of the tubular body when said tubular body is being held by said upper clamp mechanisms;

a press device for pressing the open top of the tubular body against the surface plates and forming front and rear horizontal flaps and a pair of bisymmetric triangular end flaps lapping over two sides of said flaps on said top;

a first apparatus for installing the valve plate into the pressed top of the tubular body, said first apparatus inserting one side edge of the valve plate as held on a receiving plate beneath one triangular end flap, then releasing the valve plate from the receiving plate and pulling out the receiving plate from beneath the triangular end flap;

a second apparatus for installing the cover plate into the pressed top of the tubular body, said second apparatus inserting one side edge of the cover plate as held on a receiving plate beneath the other triangular end flap and at the same time overlapping the other side edge of said cover plate over the valve plate, then releasing the cover plate from the receiving plate and pulling out the receiving plate from beneath said other triangular end flap;

means for heat-sealing the overlapping portions when the valve plate and the cover plate have been inserted beneath the triangular end flaps by said first and second apparatuses; and

means for heat-sealing the front and rear edges of the valve plate and the cover plate onto the front and rear edges of the horizontal flaps of the tubular body.

3,974,748

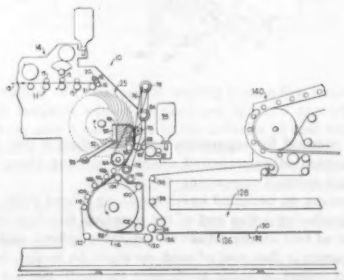
APPARATUS FOR COLLATING SHEET LIKE ELEMENTS

Erwin Bethke, Erkelenz-Keyenberg, Germany, assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Division of Ser. No. 328,135, Jan. 30, 1973, Pat. No. 3,847,384. This application Aug. 2, 1974, Ser. No. 494,191

Int. Cl.² B31B *1/96*

U.S. Cl. 93—61 A **9 Claims**



1. Apparatus for collating sheet like elements comprising,

first conveyor means for conveying a plurality of sheet like elements in spaced tandem relation at a first preselected linear speed,

second conveyor means for conveying said sheet like elements in underlapped relation as a continuous stream for further processing at a second preselected linear speed, said second conveyor means being positioned adjacent said first conveyor means,

a collator mechanism positioned between said first conveyor means and said second conveyor means, said collator mechanism including a rotatable cylindrical member having spaced arcuate slots therein, said slots having a configuration of a segment of a spiral,

stop means positioned adjacent to said cylindrical member,

said collator mechanism arranged to receive said sheet like elements in spaced tandem relation from said first conveyor means, said sheet like elements arranged to move inwardly in said arcuate slots of said cylindrical member,

said stop means arranged to stop the circular movement of said sheet like elements and the inward movement of said sheet like elements, said stop means arranged to move said sheet like elements radially outwardly in said spaced arcuate slots and align the edges of said sheet like elements on a surface of said stop means,

said stop means arranged to discharge said sheet like elements from said slots in aligned lapped relation as a continuous stream at a reduced linear velocity to said second conveyor means, and

an adhesive applicator roller positioned in abutting relation with said underlapped sheet like elements,

said second conveyor means arranged to convey said underlapped sheet like elements into abutting relation with said adhesive applicator roller for continuously applying adhesive to the exposed marginal edges of said sheet like elements.

3,974,749

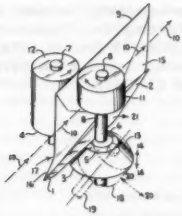
ENVELOPE FLAP SEPARATING AND DISTENDING METHOD AND MECHANISM

Harry E. Luperti, Wilton; Robert Irvine, Riverside, and Edward R. Hordeski, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 21, 1975, Ser. No. 606,602

Int. Cl.² B31B *1/26, 49/04*

U.S. Cl. 93—61 R **10 Claims**



1. A method for separating and distending a flap from a body portion of an unsealed envelope moving along a feed path, said method comprising the steps of:

A. moving an unsealed envelope along a feed path;

B. introducing a flap end of the unsealed envelope into the bite of two axially adjacent, rotatable rollers; and

C. causing a flap end of said envelope to wedge between said rollers in order to deform the body portion of the envelope about said flap end and thereby create a separation and distension of the flap from the body portion of said envelope.

3,974,750

METHOD AND APPARATUS FOR NEUTRALIZING ELECTROSTATIC CHARGES OF FILTER MATERIAL FOR SMOKERS' PRODUCTS

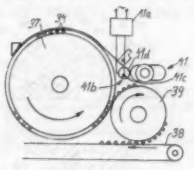
Willi Frank, Wentorf, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Feb. 6, 1975, Ser. No. 547,885

Claims priority, application Germany, Mar. 16, 1974, 2412776

Int. Cl.² B01K *1/00;* **A24C** *5/50*

U.S. Cl. 93—77 FT **11 Claims**



1. A method of treating electrically nonconductive filter material for smokers' products, particularly a rod wherein a tubular wrapper surrounds a filler, which is electrostatically charged as a result of the making and/or manipulation thereof, comprising the steps of conveying the filter material along a predetermined path; and contacting the filter material with an ionized gas in at least one predetermined portion of said path whereby the gas neutralizes the electrostatic charge of the filter material.

3,974,751

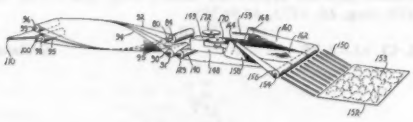
ROLLING DEVICE

Roy M. Carter, 4515 E. Garland Ave., Fresno, Calif. 93726, and Troy M. Carter, 4440 N. Argyle Ave., Fresno, Calif. 93727

Filed Oct. 16, 1974, Ser. No. 515,210

Int. Cl.² A01D *51/00*

U.S. Cl. 93—84 R **11 Claims**



1. A device for manipulating a substantially flat work object, the device comprising a frame adapted to transmit the work object therethrough; means borne by the frame for folding said object to dispose portions thereof in overlapping relation; and a pair of powered conveyor belts mounted on the frame in object receiving relation to the folding means and having juxtaposed runs twisted for inverting said object to dispose it in rested relation on the overlapping portions thereof.

3,974,752

PRESSURE CONTROL SYSTEM

Glenn A. Burgess, Downey, and Paul J. Taylor, Torrance, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 25, 1974, Ser. No. 526,669

Int. Cl.² B64D *13/00*

U.S. Cl. 98—1.5 **29 Claims**

1. Control apparatus for a fluid pressurized compartment provided with fluid inlet and outlet means in which the outlet means includes an outflow valve means having a chamber controlling the flow of fluid from the pressurized compart-

ment in response to fluid pressure manifested in the chamber in the outflow valve means, said control apparatus comprising:

a. control housing means;

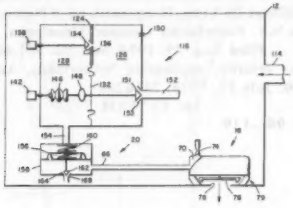
b. means providing first and second chambers in said housing means;

c. means defining a restricted passageway between said chambers;

d. fluid source means coupled to one of said housing chambers; and

e. pneumatic signal conduction means coupled between the other of said housing chambers and the chamber in the outflow valve means.

17. The method of controlling the pressure in a fluid pressurized compartment having inlet and outlet passageway means for the supply and exhaust of fluid to and from said compartment by means of throughflow valve means disposed in one of said passageway means, and having a control means for adjusting said valve means to maintain a pressure schedule in said compartment, comprising:



a. establishing first and second chambers in said control means with a restricted fluid flow passageway means therebetween;

b. coupling sources of fluid to said second chamber with one of said sources at a higher pressure and another of said sources at a lower pressure than that of the fluid in said chamber;

c. establishing a head chamber in said flow valve means having movable wall means adapted to move said valve means between fully open and fully closed positions to regulate the flow of fluid into and out of said compartment;

d. disposing fluid conduit means between said first chamber and said head chamber; and

e. disposing a pneumatic signal means in said conduit means to act on fluid pressure signals from said first chamber of said control means and to provide amplified fluid pressure signals to said head chamber.

3,974,753

AUTOMOBILE ROOF VENT

David Carl Blomgren, Menlo Park, and Robert D. Sanchez, Burlingame, both of Calif., assignors to Lois Loreen Sanchez; Robert Daniel Sanchez, both of San Mateo and David Carl Blomgren, Menlo Park, all of Calif., part interest to each

Filed Mar. 10, 1975, Ser. No. 556,735
Int. Cl.² B60H *1/26*
U.S. Cl. 98—2.14 **16 Claims**

1. In an automobile body having a fixed, rigid roof over the passenger compartment, the improvement comprising:

an opening extending across a major width of said roof and positioned slightly rearwardly of the forward edge of said roof;

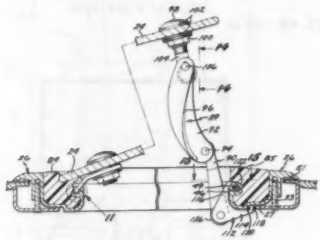
frame means carried by said roof about the periphery of said opening;

a vent closure panel having substantially the same shape and dimensions as said opening;

a frame member having an upright main channel with a cross section having a web and parallel sides coextensive with the edge of said opening;

an inwardly dependent channel having an arcuate cross section carried on the upper edge of the inboard side of the main channel of said frame member;

a first pair of side-by-side grooves extending transversely across said dependent channel on one side of said frame member to provide an arcuate tongue there between; and



a hinge plate mounted to said panel and bearing a slot along one edge thereof receiving said arcuate tongue to permit pivotal movement of said closure panel between a closed position over said opening and a forwardly inclined, open, vent position;

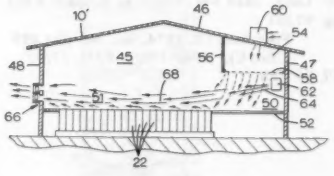
closure panel seal means carried by said frame; and latch means secured at the rear edge of said closure panel and carried on the rear edge of said frame for locking said closure panel in said closed position against said seal means and for supporting said closure panel in said vent position.

3,974,754

CONTROLLED FLUID FLOW SYSTEMS

John W. Powlesland, deceased, late of Woodbridge, Canada; by James Kenneth Kidd, executor, and by Isabella Powlesland, executrix, both of Woodbridge, Canada, assignors to Powlesland Engineering Limited, Rexdale, Canada

Filed Dec. 17, 1974, Ser. No. 533,613
Claims priority, application Canada, Dec. 4, 1974, 215459
Int. Cl.² F24F *13/00*
U.S. Cl. 98—33 A **12 Claims**



1. A method of continuously moving from a first location to a second location within an enclosed space a gas which is drawn from and is exhausted to the exterior of said enclosed space, said method comprising the steps:

admitting gas from the exterior into said enclosed space only by way of a plenum adjacent said first location, the plenum being perforate,

passing gas at slow speed out of said perforate plenum and toward said first location,

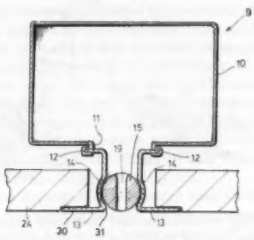
establishing at least one relatively high-speed jet of said gas at said first location and substantially within said slow speed gas, the at least one jet being directed toward said second location, thereby to entrain additional gas at said first location and urge it toward said second location,

and at the second location exhausting to the exterior substantially all of said gas arriving at said second location.

3,974,755
AIR OUTLET

Winfried Honmann, Stuttgart, Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Germany

Filed May 8, 1973, Ser. No. 358,355
Claims priority, application Germany, May 8, 1972, 2222453
Int. Cl.² F24F *7/00*
U.S. Cl. 98—40 D **19 Claims**

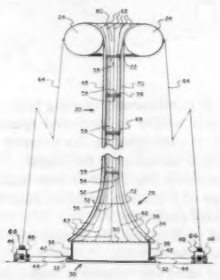


1. In an air outlet through which supply air is blown into the room of a building or the like, preferably from the ceiling of the room, for controlling the occurrence of the Coanda-effect, the improvement comprising air supply means, a plurality of blower elements each having a slot formed therein and extending in the axial direction thereof through which a stream of supply air flows into the room, said blower elements being arranged so that their slots lie in at least one row when viewed in the axial direction of the blower elements, means mounting said blower elements in the room for receiving air from said air supply means, with each element being independently angularly adjustable with respect to said mounting means to supply air within a range of definite blast directions, and with the length of each individual blower element being maximally approximately 12 – 25 times greater than the thickness of the outwardly flowing stream of supply air.

3,974,756
APPARATUS AND METHOD FOR FIELD BURNING AND FOG OR SMOG CONTROL

Otto V. Long, 3440 SW. Veterans Hospital Road, Portland, Oreg. 97201

Filed Dec. 19, 1974, Ser. No. 534,459
Int. Cl.² E04F *17/02*; **F23L** *17/02*
U.S. Cl. 98—58 **4 Claims**



2. An apparatus for conducting airborne pollutants from ground level to a high altitude comprising:

a. open-bottomed, upwardly-tapering hood means for collecting an expanding gas rising from the ground, said hood means having means at its top defining an orifice through which said gas may be conducted vertically upward;

b. tubular stack means matingly coupled with said orifice and rising vertically above said hood means for conducting said expansing gas from said hood means to the atmosphere;

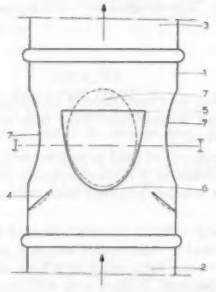
c. lighter-than-air balloon means having said stack means suspended therefrom for supporting said stack means above the ground; and

d. open-topped skirt means for ensheathing a portion of said stack means adjacent its top and forming an enclosed space around said stack means, said skirt means being attached to and suspended from said balloon means.

3,974,757
DOWN-DRAUGHT DEFLECTOR-DRAUGHT INTERRUPTER

Pieter Van Baasbank, Eelde; Hubertus A. Flendrig, Groningen, and Hilbert De Vries, Hoogezand, all of Netherlands, assignors to N.V. Nederlandse Gasunie, Groningen, Netherlands

Filed Aug. 29, 1974, Ser. No. 501,604
Claims priority, application Netherlands, Aug. 31, 1973, 7311990; July 31, 1974, 7410280
Int. Cl.² F23L *17/00*
U.S. Cl. 98—119 **11 Claims**



11. A down-draught deflector for use in the flue of a gas-fired appliance comprising a tube of circular cross-section having an internal baffle element for laterally deflecting down-draught gases and at least two peripheral escape apertures for such gases, said deflector including, in combination:

a. said tube having a substantially constant external diameter;

b. an annular combustion gas deflector disposed in the upstream end portion of said tube for deflecting combustion gases inwardly toward the axis of said tube, said combustion gas deflector defining a gas flow path which at the position of its smallest cross-section has a diameter of between 0.3–0.9 times the internal diameter of said tube;

c. said baffle element occupying within the tube a position at least partly downstream with respect to said position of smallest flow path cross-section and having the form of a flat plate disposed downstream from the said position of smallest cross-section by a distance of 0.2–1 times the internal tube diameter;

d. the largest dimension of said baffle element in a plane normal to the tube axis being between 0.2–0.9 times the internal diameter of the tube;

e. said tube wall having said apertures located therein so as to be at least in part horizontally opposite said baffle element;

f. said tube having radial walls disposed between the baffle and said tube in positions such as to prevent air entering the tube through one aperture from flowing directly out of the tube via another of said apertures.

3,974,758

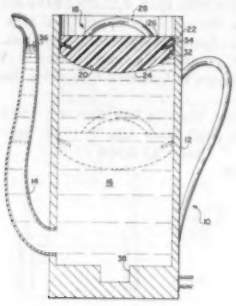
APPARATUS FOR REDUCING OXIDATION OF COFFEE

Wayne B. Stone, Jr., 7307 Nevis Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 522,226, Nov. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 506,858, Sept. 17, 1974, abandoned. This application Nov. 22, 1974, Ser. No. 526,154

Int. Cl.² A23F *1/08*

U.S. Cl. 99—275 5 Claims



1. In a pour type coffee dispensing receptacle having a reservoir and a pour spout openly communicating a lower portion of said reservoir with atmosphere and adapted to contain freshly brewed coffee to an initial level above the communication of said pour spout and reservoir, the improvement comprising; movable imperforate follower means having a surface thereof adapted for positionment in engagement with the initial coffee level in said reservoir and movable through said reservoir in engagement with the coffee level; and means for sealing said movable follower means relative to said reservoir from a first position of said follower means above the communication of said pour spout and reservoir to a second position closer to the communication of said pour spout and reservoir with the other surface of said follower means exposed to atmosphere whereby coffee contained within said reservoir may be isolated from atmosphere external of said reservoir by said follower means and coffee within said pour spout.

3,974,759

APPARATUS FOR TOASTING BREAD-LIKE ARTICLES

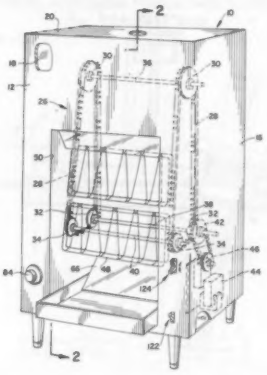
John F. Rekesius, Point Pleasant, N.J., assignor to Alco Foodservice Equipment Company, Neptune, N.J.

Filed May 20, 1974, Ser. No. 471,470

Int. Cl.² A47J *37/08*

U.S. Cl. 99—386 9 Claims

1. In gas burner type apparatus for toasting bread-like products and including a housing having wall means defining a chamber, means including first and second gas burners defining a toasting zone in said chamber, conveyor means in said chamber for receiving and carrying products through said toasting zone and between said burners, and means for delivering gas from a source to each of said first and second burners, the improvement comprising: said means for delivering gas including gas passageway means between said source and said first and second burners, and selectively operable flow control means in said gas passageway means and having first and second operating modes, said flow control means in said first mode being cooperable with said gas passageway means for gas to be delivered continuously and simultaneously to each said first and second burners and at a corresponding first flow rate for each said burner, and said flow control means in said second mode being cooperable with said gas passageway means for gas to be delivered continuously and simultaneously to each said first and second burners and to said first burner at the first flow rate therefor and to the second burner at a



second flow rate therefor, said second flow rate being less than either of said first flow rates of said first and second burners, whereby said first burner is continuously operated at said first flow rate therefor and said second burner is continuously operated simultaneously with said first burner and selectively at said first and second flow rates therefor.

3,974,760

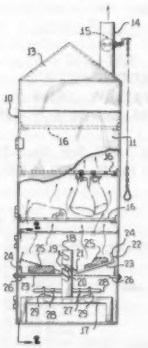
COOKING APPARATUS

Clarence Eugene Ellis, 724 Monument Road, Ponca City, Okla. 74601

Filed May 12, 1975, Ser. No. 576,809

Int. Cl.² A23B *4/04*

U.S. Cl. 99—482 10 Claims



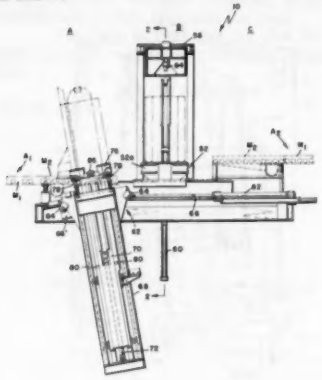
1. A cooking apparatus comprising a housing having a smoke outlet, an upper chamber in said housing having food supporting means therein, a lower chamber of said housing having solid fuel slow burning means therein, said solid fuel slow burning means comprising a substantially balanced workable fuel support tray in said lower chamber, a horizontal axis fulcrum on which said support tray rests, and a heating element positioned below said tray at a fixed elevation in said lower chamber.

3,974,761

COIL COMPACTOR

William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed May 15, 1975, Ser. No. 577,709
Int. Cl.² B65B 13/20
U.S. Cl. 100—7 8 Claims



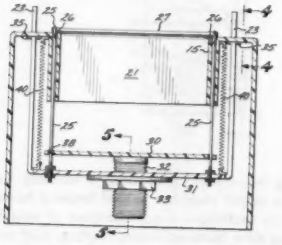
1. In a rolling mill, apparatus for axially compacting an upstanding cylindrical product coil, comprising: a base platen divided into laterally spaced sections; an upper platen overlying and spaced vertically above said base platen; transport means for moving an upstanding coil laterally into an operative position between said platens, said transport means including an elongated mandrel extending axially through the coil and an elevator head raised by said mandrel to a position supporting the coil bottom at a level above said base platen, and a first operating means for lowering said upper platen, the descent of said upper platen being accompanied by a corresponding axial lowering of said mandrel under the influence of a second operating means and a lowering of said elevator head to the level of said base platen, with the result that the coil is axially compacted between said platens while being supported internally by said mandrel.

3,974,762

BANDING DEVICE

Edward Kiyoshi Kita, 1574 W. 183rd St., Gardena, Calif. 90248, and Noriyoshi Matsui, 3630 W. 230th St., Torrance, Calif. 90505

Filed Oct. 24, 1975, Ser. No. 625,597
Int. Cl.² B65B 13/02, 67/00
U.S. Cl. 100—9 8 Claims



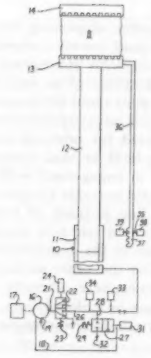
5. Apparatus for banding bundles of articles, comprising:
an enclosure having an opening formed therein for limiting the size of the bundle received on the interior thereof;
a platform disposed within said enclosure across said opening;
a plurality of springs connecting said platform to said enclosure at selected points proximate said opening;
guide tabs connected to said platform and vertically extending therefrom to slidably project to the exterior of said enclosure;
stop elements formed on said guide tabs for limiting the progression thereof through said enclosure; and
a plurality of pins mounted on said platform to project through said enclosure along the periphery of said opening for engaging a rubber band thereabout.

3,974,763

PROCESS FOR BALING FIBERS

Donald W. Van Doorn, Columbus, Ga.; Jack L. Colquett, Schlater, Miss.; James B. Hawkins, Columbus, Ga.; William C. Pease, III, Columbus, Ga., and Tommy W. Webb, Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Division of Ser. No. 426,089, Dec. 19, 1973, Pat. No. 3,916,778. This application Aug. 7, 1975, Ser. No. 602,896
Int. Cl.² B30B 13/00
U.S. Cl. 100—35 5 Claims



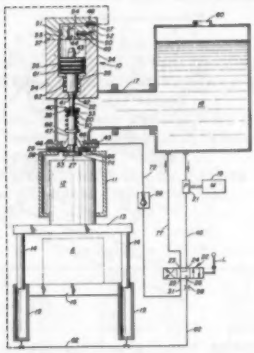
1. The process of baling batches of fibers which have varying characteristics affecting the amount of force required to form bales within a given maximum and minimum size range comprising:
a. compacting the fibers between a pair of platens at least one of which is power driven toward the other until the bale being formed exerts a substantially predetermined reaction force,
b. generating a signal if said predetermined reaction force is reached before the bale reaches said maximum size,
c. generating a signal if said predetermined reaction force is not reached when the bale reaches said minimum size, and
d. utilizing the signals produced in (b) or (c) above, as the case may be, to stop further compaction of the bale.

3,974,764

EXHAUST VALVE

Edward L. Horton, Jr., and Anna M. Horton, both of 4706 Highview Blvd., Erie, Pa. 16509

Filed Apr. 12, 1974, Ser. No. 460,359
Int. Cl.² B30B 1/34, 15/18; F15B 13/042
U.S. Cl. 100—269 R 8 Claims



1. In combination a machine having a ram cylinder, a ram piston in said cylinder extending downwardly therefrom and engaging a crosshead,

a platen supported below said ram piston for supporting work to be engaged by said crosshead,

a reservoir adapted to contain liquid supported above said ram cylinder and having a passage in a wall thereof,

means connecting said reservoir to said ram cylinder,

said means connecting said reservoir to said ram cylinder comprising

a flow passage,

a separate valve seat supported on said ram cylinder around said flow passage positioned between the top of said ram cylinder and said reservoir and

a freefill and exhaust valve adapted to engage said valve seat to stop the flow of fluid from said reservoir to said ram cyliner to provide fast approach speeds and fast return speeds of said ram whereby fluid from said reservoir can flow to said ram cylinder at low pressure when said freefill valve is open,

pilot motor means connected to said free fill and exhaust valve for opening said free fill and exhaust valve, a plurality of circumferentially spaced orifice means in said valve seat opening directly into said ram cylinder and pump means connecting said reservoir to said cylinder through said reservoir passage and said spaced orifice means to said ram cylinder,

and check valve means connected to said orifice means for allowing fluid to flow from said pump through said orifice means in said seat forming a path for the flow of fluid from said orifice means through said pump at high pressure,

and pushback pistons supporting said platen

pushback cylinders supporting said crosshead and receiving said pushback pistons and

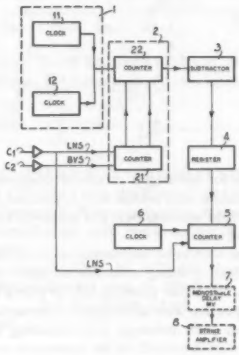
means selectively connecting fluid from said reservoir to said pushback cylinders and to said pilot motor means controlling said freefill valve and to said orifice means.

3,974,765

APPARATUS FOR CORRECTING THE WAY IN WHICH PRINT HAMMERS STRIKE

Alain Francois Jossic, Belfort, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Continuation-in-part of Ser. No. 502,166, Aug. 30, 1974, abandoned. This application Jan. 14, 1975, Ser. No. 540,821
Claims priority, application France, Sept. 5, 1973, 73.32064
Int. Cl.² B41J 9/26
U.S. Cl. 101—111 11 Claims



1. In a strike connection circuit arrangement for an impact printer comprising a carrier for moving a character past a sheet support at a nominal speed, reference indicator means for identifying the location of the character on the carrier, first sensor means associated with said carrier for generating a synchronizing pulse in response to the movement of the reference indicator means past a first predetermined location, at least one strike hammer adapted to be energized from a rest position to a strike position in contact with the character to effect a print out of the character on the sheet while the carrier is moving, control circuit means operably connected to said strike hammer for controlling the energization thereof including a logic unit responsive to said synchronizing pulse, a delay generator connected to said logic unit for generating a delay pulse in response to said synchronizing pulse and a strike amplifier responsive to said delay pulse for controlling the energization of said strike hammer, the improvement comprising:

second sensor means associated with said carrier for generating a check pulse in response to movement of said indicator past a second predetermined location, circuit means for generating a deviation signal representing the deviation of the actual carrier speed from the nominal carrier speed in response to the time interval separating said synchronizing pulse and said check pulse, and said delay generator being responsive to said deviation signal to thereby control the time in which the delay generator generates said delay pulse, said time being proportional to the value of the deviation signal, and said time of generation commencing with the receipt of the synchronizing pulse by the delay means.

3,974,766

PROCESS FOR IMPRINTING SPACED-APART WEB SECTIONS WITH A COMPOSITE PATTERN

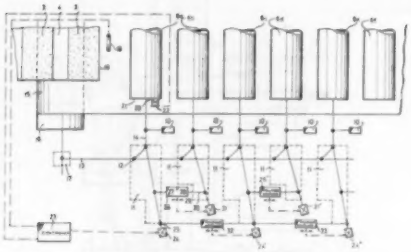
Peter Zimmer, untere Sparchen 54, A 6330 Kufstein, Austria

Division of Ser. No. 395,554, Sept. 10, 1973. This application July 1, 1974, Ser. No. 485,001

The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl.² B41F *15/10*

U.S. Cl. 101—129 **8 Claims**



3. A process for printing a recurrent composite pattern on equispaced sections of a textile web separated by zones to be left unprinted, said sections being of identical length, comprising the steps of:

a. passing the web to be imprinted underneath a plurality of parallel rotary printing units spaced apart in the direction of web motion while rotating said printing units in unison about respective axes at a speed commensurate with the web speed, each printing unit including a cylindrically curved screen centered on the respective axis with an arc length equal to the length of a section for the printing of a respective pattern component;

b. detecting the arrival of a leading edge of any of said sections at a fixed point upstream of the first printing unit;

c. detecting the passage of a predetermined point on the periphery of said first printing unit through a certain angular position;

d. angularly adjusting all said printing units, in accordance with the relative time position of the events detected in steps (b) and (c), sequentially and with intervening delays corresponding to the travel time of said section from one printing unit to the next; and

e. storing a measure of the angular adjustment according to step (d) in a memory decoupled from said first printing unit preparatorily to adjustment of each subsequent printing unit, thereby enabling readjustment of said first printing unit upon the approach of each new section.

3,974,767

PRINTING METHOD AND APPARATUS

A. Torvald Sverker Hagelberg, Molnlycke, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

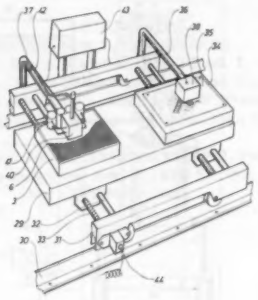
Continuation of Ser. No. 444,555, Feb. 21, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,298

Claims priority, application Sweden, Mar. 1, 1973, 73028649

Int. Cl.² B41M *1/10;* **B41F** *3/36;* **H04N** *1/22*

U.S. Cl. 101—151 **3 Claims**

1. A printing method for the reproduction of multiple copies of a multi-colored original using a printing form having a printing surface divided into a neutral screen pattern with each division of the screen pattern having an orifice connected to a channel extending from the printing surface and with each of the channels having a volume capable of storing a quantity of ink sufficient to reproduce a multiple number of copies of the original, wherein the method comprises the steps of scanning the original to be reproduced by directing an illumination source against a selected area of the original corresponding to a division of the screen pattern of the printing surface and using colored filter photocells directed at the illuminated selected area of the original for determining the color in the selected area, transmitting a signal based on the color scanned to a blending apparatus and blending ink from at least three colors of ink which blended ink has a color similar to the color scanned, injecting a quantity of the blended ink sufficient to reproduce multiple copies of the selected area into the channel in the screen pattern corresponding to the selected area of the original scanned, repeating the scanning, blending, and injecting steps for selected areas until the entire original has been scanned and the corresponding channels opening to the screen pattern of the printing surface have been injected with the blended ink, moving the printing surface into a printing position, placing an individual product to be printed in contact with the printing surface, introducing pressurized air into each of the channels for forcing the ink in each of the channels through the orifice in the printed surface onto the surface of the product to be printed so that a layer of printing ink is deposited on the product providing a reproduction of the original, removing the printed product and repeating the printing operation for a multiple number of the products.



3,974,768

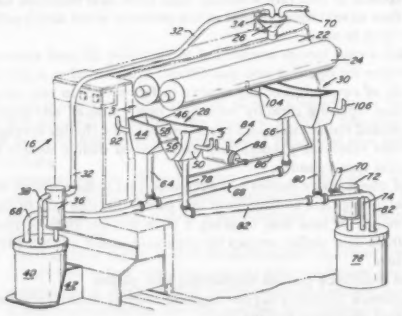
DUAL INK CIRCULATION AND WASH-UP SYSTEM FOR A PRESS

William Grobman, Philadelphia, Pa., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed Mar. 31, 1975, Ser. No. 563,752

Int. Cl.² B41F *35/04;* **B41L** *41/04*

U.S. Cl. 101—425 **13 Claims**



1. A system for distributing a printing medium and a wash liquid comprising a printing press, an elongated printing me-

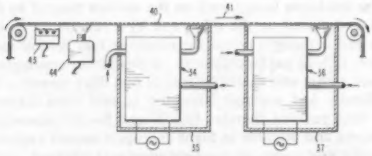
dium application means supported by the press, a plurality of discrete supply means for sequentially supplying a printing medium to said application means, at least one receptacle positioned adjacent said application means to receive any excess printing medium therefrom, said receptacle having at least two compartments, each compartment having a drain conduit, conduit means connecting each compartment with a wash liquid supply means for selective introduction of a wash liquid into said compartments and means to selectively divert liquid from said application means into only one of said receptacle compartments at any given time so that printing may be accomplished while the other compartment is being cleaned by a wash liquid from said wash liquid supply means.

3,974,769

METHOD AND APPARATUS FOR RECORDING INFORMATION ON A RECORDING SURFACE THROUGH THE USE OF MISTS

Frederick Hochberg, and Arnold Reisman, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1975, Ser. No. 581,058
Int. Cl.² B41M *1/42*; G03G *5/12*
U.S. Cl. 101—426 **30 Claims**



1. An apparatus for recording information on a recording surface including:

first means to selectively apply a mist of at least a first material to selected portions of the recording surface;

and second means to apply to the recording surface a mist of a second material that reacts with the first material on the selected portions of the recording surface to produce a contrast with the recording surface to record information at the selected portions of the recording surface.

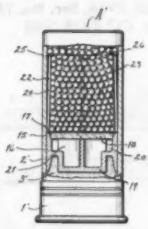
3,974,770

SHOT CONTAINER FOR SHOTGUN CARTRIDGES

Homer E. Clark, Jr., Alton, Ill., assignor to S & W Ammunition Company, Rock Creek, Ohio

Continuation of Ser. No. 680,262, Nov. 2, 1967, abandoned, which is a continuation of Ser. No. 570,380, Aug. 4, 1966, abandoned, which is a continuation of Ser. No. 437,616, Feb. 11, 1965, abandoned, which is a continuation of Ser. No. 297,808, July 26, 1963, abandoned. This application Aug. 26, 1974, Ser. No. 500,648
Int. Cl.² F42B *7/08*
U.S. Cl. 102—42 C **6 Claims**

1. For use with a shotgun cartridge, a wad column comprising an elongated, cylindrical body, an obturating wad portion being provided at one end of said wad column, a relatively thin-walled shot container portion being provided in the other end portion of said wad column, the end of said shot container portion remote from said obturating wad portion being open, the end of said obturating wad portion remote from said shot container portion being closed and defining with adjacent body portion of said column an inner compartment normally continuous with the interior of the shot container portion, a wad seated within said wad column for defining the inner limit of the shot container portion and being in planer parallel relationship to the closed end of said obturating wad portion for completing enclosure of said compartment, a plurality of thin, frangible fins disposed in said compartment and in normal abutting relationship on one edge to the said wad, said shot container portion having a plurality of narrow elongated openings extending longitudinally of the shot container portion, and frangible means provided adjacent the ends of said elongated openings, the open end of said shot container portion.

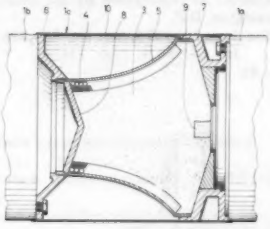


3,974,771

SPLINTER WARHEAD FOR GUIDED FLYING BODIES FOR COMBATING AERIAL TARGETS

Franz Rudolf Thomanek, Schrobenhausen, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, Germany

Continuation-in-part of Ser. No. 670,481, June 26, 1967, abandoned. This application Aug. 9, 1967, Ser. No. 661,165
Int. Cl.² F42B *13/48*
U.S. Cl. 102—67 **10 Claims**



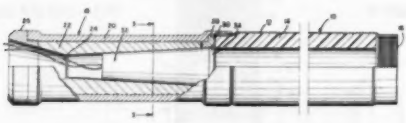
1. In a guided flying body for combating aerial targets, and of the type including front and rear body portions interconnected by a warhead envelope constructed as a splinter warhead transporting structural member carrying an explosive charge detonatable by a proximity fuse upon approach of the flying body to a target: the improvement in which said warhead comprises, in combination, a circular cross section explosive charge; a warhead envelope surrounding said charge; and a lining of pre-formed splinters on the circumferential periphery of said explosive charge and within said warhead envelope; said splinters having essentially a ball shape and an individual weight of less than 1 g; the average value of the diameter of said explosive charge being in excess of 25 times the average value of the diameter of said splinters; the circumferential peripheral surface of said explosive charge being outwardly concave and defined by an arcuate generatrix; the rear portion of said outward concave surface being a substnatial distance radially outwardly of the front portion of said outwardly concave surface, whereby, upon detonation of said explosive charge, a cone-shaped splinter ray is directed forwardly of the direction of movement of said body.

3,974,772

ROCKET IGNITER

Joseph E. Pelham, Huntsville, Ala., and Frank W. La Haye, Hollister, Calif., assignors to Thiokol Corporation, Newtown, Pa.

Filed June 25, 1958, Ser. No. 745,799
Int. Cl.² F42B 5/08
U.S. Cl. 102—70.2 A 3 Claims



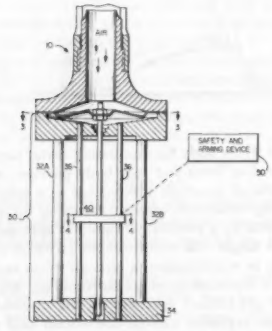
1. An igniter adapted to be positioned in the convergent portion of the nozzle of a rocket engine, said igniter comprising, a tapered combustible plastic casing having a small end and a large end, said casing having a stepped recess therein comprising a large cavity formed in the large end of said casing and a relatively small cavity opening into the inner end of said large cavity, a squib including a primer charge positioned in said small cavity, a body of pyrotechnic material positioned in said large cavity adjacent to said primer charge, a closure disc positioned in said large cavity to hold said pyrotechnic material therein, and squib-activating means for igniting said primer charge, said activating means extending from said squib through said casing and out the small end thereof, the inner end of said small cavity and the small end of said casing being substantially spaced from one another to provide a substantial body of combustible plastic therebetween.

3,974,773

ENERGY BASE FOR SAFETY AND ARMING DEVICE

Leo P. Rongus, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,736
Int. Cl.² F42C 5/00, 15/32
U.S. Cl. 102—81 8 Claims



1. An apparatus providing an energy base for actuating a safety and arming device comprising:

oscillator means having a diaphragm means which oscillates at a predetermined frequency;

oscillating rod means coupled to said diaphragm means and extending from said oscillator means, said rod means oscillating along the longitudinal axis thereof in response to the oscillation of said diaphragm means; and

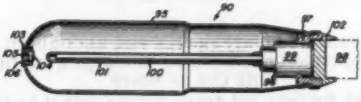
slider means coupled to said rod means to incrementally travel along said rod means in one direction in response to a first direction of oscillating movement of said rod means.

3,974,774

PROJECTILE FOR A WEAPON SYSTEM

Joseph G. Schaffner, Timonium; Joseph A. Werner, Joppa, and Jacob Klein, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 2, 1971, Ser. No. 194,837
Int. Cl.² F42B 13/46
U.S. Cl. 102—90 3 Claims



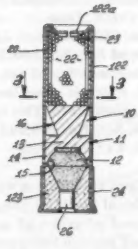
1. A projectile assembly adapted to be propelled and guided to the target site by attachable propelling means and capable of being fractured to disseminate its payload comprising of: an elongated fracturable tube-like case adapted to receive a payload closed on one end by an ogive shaped impact nose of uniform thickness interrupted on the surface thereof by filler means and closed on the other end by a reinforced reverse-drawn end defining a recess for receiving fuse means and an adaptor; a fluid payload capable of producing conflagration disposed within said casing by way of said filler means; a filler plug fixedly and sealingly mounted in said filler means to retain said payload therein; fuse means fixedly mounted in said recess and armable in flight and upon impact capable of fracturing said case and disseminating said payload; and an adaptor removably mounted in said recess enclosing and protecting the fuse means and having coupling means for attachment to said propelling means.

3,974,775

WAD UNIT FOR SHOTGUN SHELL

Jack A. Kerzman, 18606 E. Leadora, Glendora, Calif. 91740, and Helmut Rail, 2011 Mission St., South Pasadena, Calif. 91030

Filed Nov. 4, 1974, Ser. No. 520,358
Int. Cl.² F42B 7/08
U.S. Cl. 102—95 9 Claims



1. In a wad for a shotgun shell,

a. an axially downwardly opening cup having a zone adapted to receive an explosive charge, the cup having a transverse base directly above said zone and a depending annular skirt,

b. an upright central plunger carried by the base, and

c. multiple circularly spaced upwardly elongated leaves carried by and projecting upwardly from the plunger to be flexed inwardly and form with the plunger a pellet chamber,

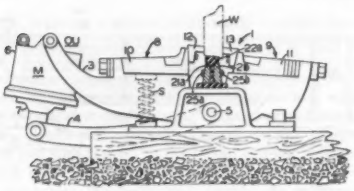
d. said wad consisting of molded plastic material and the plunger having frusto-conical configuration and tapering downwardly toward the base to deform the base centrally downwardly relative to the skirt in response to detonation of the charge, the lowermost and narrowest extent of the plunger projecting downwardly to integrally merge with the base at a first locus centrally of the base, the base having reduced axial thickness at an annular second locus immediately about said first locus to be structurally weakened at said second locus, the base, at said second locus, forming a recess opening upwardly annularly about said lowermost and narrowest extent of the plunger, the uppermost radially outer extent of said frusto-conical plunger extending in axial alignment with said cup annular skirt.

3,974,776

RAILWAY ANTINOISE POLLUTION ARRANGEMENTS

Philip J. DeIvernoise, Jr., Monroeville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 15, 1974, Ser. No. 523,981
Int. Cl.² B61B *1/00*; E01B *19/00*
U.S. Cl. 104—26 A **11 Claims**



1. In combination, a railroad car retarder having a plurality of operating units disposed along the length of a running rail of a trackway, an elongated braking bar disposed on each side of said running rail and carried by said plurality of said operating units, said elongated braking bar including a brake beam and a brake shoe for engaging the wheels of railway vehicles, characterized by said running rail including alternate substantial lengths of metal and vibrational dampening material for contacting the passing wheels of the railway vehicles, said vibrational dampening material for absorbing sound producing energy from the passing wheels of the railway vehicles for preventing the development of wheel squealing noises, and means for reinforcing said vibrational dampening material to form a substantially rigid running rail.

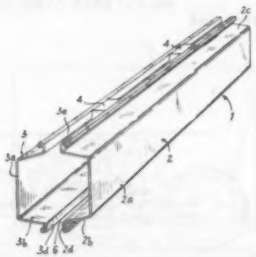
3,974,777

ROLLING ELEMENT FOR A HANDLING EQUIPMENT AND EQUIPMENTS COMPRISING SUCH ELEMENTS

Maxime Monne, 19 bis Boulevard Delessert, 75016 Paris, France

Filed Oct. 29, 1974, Ser. No. 518,997
Int. Cl.² B61B *3/00*; E01B *25/22*
U.S. Cl. 104—94 **4 Claims**

1. In a hollow track member for a material handling installation comprising at least two elongated members defining a longitudinal slot extending longitudinally thereof and adapted to receive at least one traveller, the improvement according to which said track member comprises two identical channel-shaped sheet piles whose section comprises a central web and first and second sidewalls having the same dimensions extending along the sides of said web symmetrically with respect to a longitudinal plane of symmetry of the web, said sidewalls each carrying a flange substantially parallel to said web, said flanges being bent outwardly away from said plane of symmetry, said sheet piles being positioned with their concave surfaces facing each other, the flanges of said first sidewalls separated from each other to form said slot, and the flanges of said second sidewalls rigidly connected to each other by at least one spacer member located therebetween, said at least one spacer member having the cross-sectional shape of an



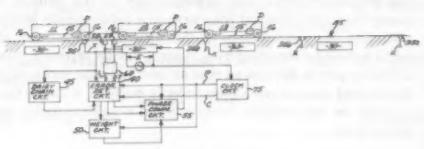
inverted T, with the surfaces of the standing part of the T in contact with two flanges of the sheet piles and the arms of the cross-bar of the T in contact with the inner surface of two sidewalls of the sheet piles.

3,974,778

SPEED CONTROL SYSTEM

Millard G. Black, Santa Ana; Warren D. Sheldon, Glendora, and Dennis S. Cook, Orange, all of Calif., assignors to Walt Disney Productions, Burbank, Calif.

Filed Aug. 12, 1974, Ser. No. 496,389
Int. Cl.² B61B *13/12*
U.S. Cl. 104—148 LM **15 Claims**

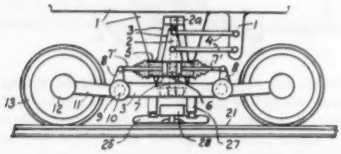


1. A vehicle propulsion system comprising:
a guideway;
an excitation source producing an alternating electrical signal;
a vehicle disposed for rolling along said guideway;
a secondary mounted on the underside of said vehicle;
a plurality of primary winding segments disposed in said guideway;
speed trap means to determine the speed of said vehicle and generate a digital velocity signal therefrom;
comparison means to compare said velocity signal to a reference signal and determine the deviation of the speed of said vehicle from a preselected speed;
a plurality of control means each disposed in associated relationship with a corresponding one of said winding segments and operatively connected to commutate said alternating electrical signal to said winding segments in commutation increments proportional in power to said deviation of the speed of said vehicle from a preselected speed; and
a plurality of proximity means disposed in associated relationship with corresponding ones of said control means for completing the connection between said corresponding ones of said winding segments and said control means when said vehicle is located on said guideway in inductive relationship between said secondary and said one winding segment and for concurrently disabling selected other ones of said control means.

3,974,779
VEHICLE BOGIE

K. Julius Lindblom, Sollentuna, and Anders S. E. Kipping, Enskede, both of Sweden, assignors to Automatisk Doseringskompensator AB, Sollentuna, Sweden

Filed Oct. 31, 1974, Ser. No. 519,665
Int. Cl.² B61D *15/00*
U.S. Cl. 105—164 **13 Claims**

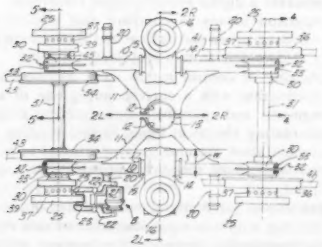


1. A vehicle bogie comprising a carrying unit, including wheels for a vehicle body, and which on each side thereof has mounted thereto at least one cylinder-piston device being actuated by a pressure fluid and connected to a shaft mounting a pair of wheels via swinging arms holding the carrying unit at a predetermined distance from the rolling plane during normal conditions said cylinder-piston devices being actuable to incline a vehicle body, which is mounted on the carrying unit, towards the center of a curve through which the vehicle moves, the vehicle body being suspended in the carrying unit by means of pendulum links, one end of each link is pivotally mounted to the vehicle body, the magnitude of deflection of the pendulum links, and consequently of the vehicle body, away from the center of the curve in a substantially horizontal direction perpendicularly to the direction of motion of the vehicle being controlled by a control device separate from the cylinder-piston devices so that at simultaneous inclination and horizontal movement of the vehicle body in a curve the passengers in the vehicle body obtain a substantially vertical movement.

3,974,780
CHANGEABLE GAUGE RAILING TRUCK

Henry F. Estrada, Havertown, Pa., assignor to The Budd Company, Troy, Mich.

Filed July 8, 1974, Ser. No. 486,545
Int. Cl.² B60B *35/10*, *37/04*; B61F *13/00*; B61H *1/00*
U.S. Cl. 105—178 **1 Claim**

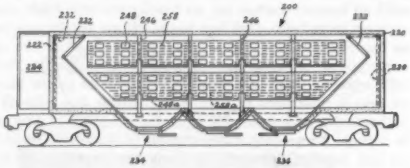


1. A railway truck adapted for use on relatively wide and narrow gage tracks with respect to each other, comprising in combination, side frames, axle-bearing units, releasable axle retaining means adapted to mount said axle-bearing units to said side frames, and axle units adapted to be retained by said axle-bearing units, each respective side frame being positioned between the adjacent rails said axle units dimensioned with large diameter portions to receive wheels on the inboard sides of said side frames when said truck is used with said relatively narrow gage track, intermediate-diameter portions to receive bearing sleeves to hold said axle-bearing units, and small-diameter portions to receive wheels on the outboard side of said side frames when said truck is used with said wide gage track, means for mounting brake disks on said axle located outboard of said side frames at the same transverse positions when said truck is used on either gage tracks, and brake operating units mounted on the outside of the side frames in the same transverse positions when said truck is used with either gage tracks.

3,974,781
BAFFLED BULK SHIPMENT OF LADING IN CONVERTIBLE RAILWAY CARS

Edgar F. Josephson, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 411,364, Oct. 31, 1973, Pat. No. 3,899,981. This application Mar. 6, 1975, Ser. No. 556,039
Int. Cl.² B60D *1/56*
U.S. Cl. 105—243 **19 Claims**



1. A convertible hopper-box railway car for transmitting perishable lading comprising:
generally vertically extending spaced apart railway car sides having insulation provided thereon at least through a substantial portion of the vertical extent; generally spaced apart railway car end sections joined to said car sides, said end sections having insulation provided on at least a substantial portion of the vertical extent; an insulated roof joining said sides and ends; movable end slope sheets mounted at opposite ends of a bulk lading carrying compartment; said slope sheets being movable from a stored position to an operative position to engage at least a portion of bulk lading and facilitate the unloading thereof through at least one hopper outlet mounted in communication with at least one floor opening in said car; and baffle supports mounting a plurality of baffles in said car adapted to reduce the weight that the upper lading would normally exert upon the lower lading in the absence of said baffles, at least one of said baffle supports affixed to at least one of said car sides.

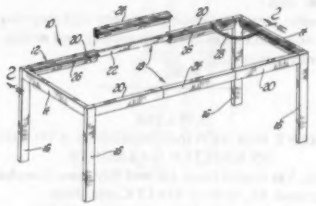
3,974,782
SLIDE ASSEMBLY FOR EXTENDABLE TABLE

Alfred E. Ruckriegel, Jasper, Ind., assignor to Winzeler Stamping Co., Montpelier, Ohio

Filed June 9, 1975, Ser. No. 585,418
Int. Cl.² A47B *1/08*
U.S. Cl. 108—83 **9 Claims**

1. An extendable table comprising: an extendable frame for supporting table tops of different lengths; the frame including a pair of laterally spaced slide assemblies interconnecting opposite ends thereof; each slide assembly including an elongated female beam of a hollow construction secured to one end of the frame so that one end of the beam opens toward the other end of the frame; each slide assembly also including an elongated male support member of a smaller cross-section than the interior of the female beam; the male support member having a first end received within the open end of the female beam and a second end secured to the other end of the

frame; the female beam including vertically spaced top and bottom walls and the bottom wall defining at least one securement opening adjacent the open end of the beam; said securement opening having an end that opens toward said other end of the frame; a first pad projecting downwardly from the extreme first end of the support member so as to engage the interior of the bottom wall of the beam and maintain the support member in a spaced relationship with respect thereto; a second pad including an upper portion that engages the support member from above adjacent the open end of the



beam to maintain a spaced relationship between the support member and the top wall of the beam; the second pad also including a securement portion that is inserted through the end of the securement opening so as to project downwardly through the securement opening in the bottom wall of the beam; the securement portion of the second pad being welded to the exterior side of the bottom beam wall to secure the second pad with respect to the beam; and the pads cooperating with each other to slidably support the support member with respect to the beam and rigidify the interconnection therebetween during use of the table.

3,974,783

METHOD FOR IMPROVING SEWAGE SLUDGE INCINERATION

Gardner Flynn, Audubon, Pa., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 22, 1975, Ser. No. 606,920
Int. Cl.² F23G *5/00*
U.S. Cl. 110—8 R **5 Claims**

1. A method of incinerating sewage sludge which comprises burning said sewage sludge in the presence of from 50–8000 ppm by weight based on dry sewage sludge, of an additive composition of a compound of a metal selected from the group consisting of copper, cobalt, manganese, iron and calcium which is effective in lowering the ignition temperature of carbon and a magnesium compound from the group consisting of magnesium oxide and magnesium compounds decomposing to magnesium oxide under combustion conditions, the weight ratio of said magnesium compound, expressed as Mg, to said compound of a metal expressed as said metal, being within the range of 5:1 to 35:1.

3,974,784

SOLID-LIQUID WASTE INCINERATOR UTILIZING LIQUID CATALYSTS

Jacob Greenberg, Margate, N.J., assignor to Anti-Pollution Systems, Inc., Pleasantville, N.J.

Filed Apr. 17, 1975, Ser. No. 569,066
Int. Cl.² F23G *7/00*
U.S. Cl. 110—8 R **14 Claims**

1. An incinerator for solid and liquid waste comprising

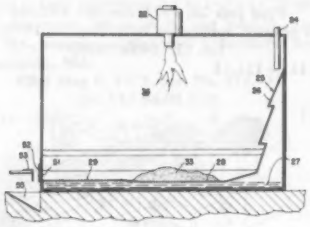
a. a housing;

b. a burning stage disposed within said housing for burning said waste to produce exhaust gas and a reduced volume of ash residue;

c. feed means for introducing said waste into said burning stage;

d. discharge means for removing said ash residue from said burning stage;

e. a gas treatment stage disposed within said housing and comprising a liquid catalyst for catalytically treating said exhaust gas;



f. communication means for allowing said exhaust gas to pass by a first path from said burning stage to said gas treatment stage;

g. exhaust means for expelling said exhaust gas into the atmosphere; and,

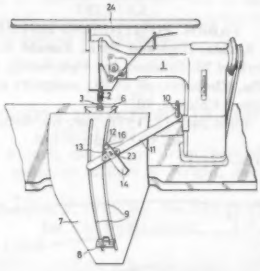
h. heat transfer means between said burning stage and said gas treatment stage for transferring heat along a second path so that said liquid catalyst is maintained liquid by the heat in said burning stage.

3,974,785

METHOD AND ARRANGEMENT FOR SEWING A SLIDE FASTENER INTO A CARRIER MATERIAL

Hansjürgen Pickert, Kerkrade, Niederlande, and Dieter Sesselmann, Rodingen, both of Germany, assignors to William Prym-Werke KG, Stolberg, Rhineland, Germany

Filed Dec. 19, 1974, Ser. No. 534,506
Claims priority, application Germany, Dec. 22, 1973, 2364393
Int. Cl.² D05B *3/12*
U.S. Cl. 112—113 **9 Claims**



1. An arrangement for sewing a slide fastener onto opposite sides of a slit in a carrier material that is composed of an upper and a lower layer, comprising a multiple needle sewing machine having a presser foot and first and second feed dogs for said upper and said lower layer, respectively, in the region of said presser foot; and means for engaging said carrier material and said slide fastener in a predetermined relationship to one another, said means comprising an arm and a pivot mounting said arm on said sewing machine for pivotal movement between a first position located laterally outside the region of said presser foot for conveniently placing said carrier material and said slide fastener thereon, and a second position in which

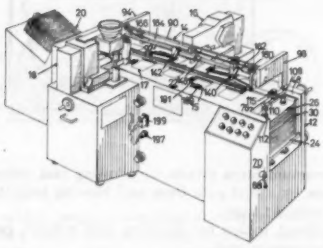
it supplies said carrier material and said slide fastener to said region to be transported in said predetermined relationship by said feed dogs during the sewing operation.

3,974,786

AUTOMATIC SEWING UNIT

Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed July 26, 1974, Ser. No. 492,185
Claims priority, application Italy, July 26, 1973, 42908/73
Int. Cl.² D05B *19/00*
U.S. Cl. 112—121.12 9 Claims



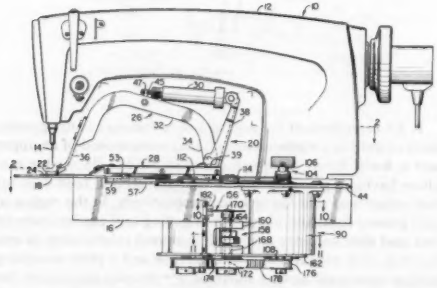
1. An automatic sewing unit formed by a loading station, a mounting table, a transfer mechanism, two preparing stations, two sewing stations and a stacking station for the sewn pieces, said transfer mechanism being a mounting member sliding reciprocally forward and backward on a guide driven by a pneumatic motor and whereon are positioned a first group of kinematic members and their relative pneumatic actuators to obtain the lifting and lowering movements from and to the mounting table of a series of pressers provided for the intermittent conveyance of the fabric pieces to be sewn from a station to the following one and a second group of kinematic members and their relative pneumatic actuators to make vertical drawing displacements of the fabric piece from a stack placed in the loading station, progressive movement of the fabric pieces toward the following stations being made by displacement of said mounting member along said guide during its forward feed stroke.

3,974,787

FABRIC POSITIONING HOLDER

Gerald A. Krautz, Highland Park; Ronald A. Godsen, Lombard; Herbert M. Gunner, Jr., Oak Forest, and Michael N. Tranquilla, Elmhurst, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Jan. 22, 1975, Ser. No. 543,099
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 11 Claims



1. An automatic sewing machine including a sewing machine having a sewing needle, a storage element means containing information, an electrical means for reading said information in a predetermined sequence and translating the information into electrical output signals representative thereof wherein the improvement comprises:

a high pressure holder means pivotally secured to said sewing machine, including a lever means and a clamp means, carried thereon;

first and second stepping motor means being responsive to certain of said electrical output signals resulting in a predetermined amount of output actuation;

mounting means carrying said motor means on said sewing machine, one on each side thereof, including, bracket means pivotally secured to said sewing machine and tension means urging said bracket into a predetermined position; and

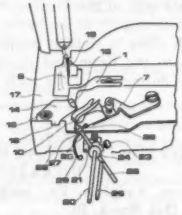
force transfer means extending between said stepping motor means and said extensible lever means, and acting against said tension means.

3,974,788

ATTACHMENT FOR SEWING BORDERS AND COLLARS ON KNITTED GARMENTS

Ugo Pignatti, Via Guido Fassi 12, and Giuliano Scacchetti, Via L. Spallanzani 16, both of 41012 Carpi, Italy

Filed June 18, 1974, Ser. No. 480,502
Claims priority, application Italy, July 27, 1973, 40074/73
Int. Cl.² D05B *35/04*
U.S. Cl. 112—140 10 Claims



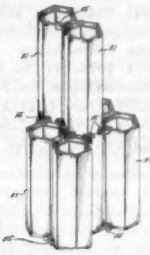
1. An arrangement, applicable to sewing machines for sewing borders and collars or knitted garments at the collar's and sleeves' openings, comprising a metal pre-shaping structure including a first movable rod hinged by a bracket to a side of the sewing machine and over which first rod a collar slide may travel, said collar slide being provided with a second rod which is provided at one end with a third rod extending perpendicular with respect to said second rod and parallel to said first rod, and at the other end with an arcuate rod for starting the curvature of the collar, said arcuate rod being movably fastened to said second rod; a metal shaping structure downstream of said metal pre-shaping structure terminating with a flat portion which is provided with a hole and curved into nearly a Z-shaped configuration with rounded-off corners, said shaping structure having in a portion opposite said flat portion a recess delimiting a cavity through which the curved collar passes and having its end shaped as two vertically extending limbs, each curved in a direction opposite to the other end offset relative thereto so as to internally fold the edges of the collar passing therebetween, said metal shaping structure further having a point against which the collar slides; and a metal guiding structure downstream of said metal shaping structure formed of thin sheet metal terminating with a split end and provided with a fold and a curved end perpendicular to the structure itself, the collar sliding over the curved end after sliding against the point for easing the introduction of the collar underneath the presser foot of the sewing machine.

3,974,789

FLOATING STRUCTURES INCLUDING HONEYCOMB CORES FORMED OF ELONGATE HEXAGONAL CELLS

Sebastian J. de Groot, Trans Canada Highway, R.R. No. 1, Cobble Hill, British Columbia, Canada (VOR ILO)

Filed Aug. 5, 1974, Ser. No. 494,830
Int. Cl.² B63B *35/00, 5/14*
U.S. Cl. 114—.5 F 29 Claims



19. A concrete floating structure comprising:

a plurality of elongate cells, each of said cells having a hexagonal cross-sectional shape, the walls of said cells being essentially entirely formed of reinforced concrete;

orienting, spacing and attaching means for attaching said cells to one another in spaced relationship so as to form a honeycomb of spaced cells;

concrete located in the space between said cells so as to attach adjacent cells together such that a structurally uninterrupted lightweight reinforced concrete honeycomb core is formed; and,

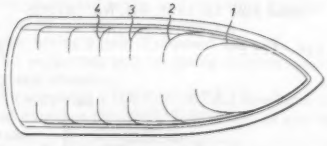
a housing surrounding said structurally uninterrupted lightweight reinforced concrete honeycomb core, said housing formed of precast concrete panels connected together and to said structurally uninterrupted lightweight reinforced concrete honeycomb core by expansion joints that allow a predetermined amount of housing deformation to occur without cracking and breaking of either the precast concrete panels forming said housing or said structurally uninterrupted lightweight reinforced concrete honeycomb core.

3,974,790

BOTTOM FOR PLANING BOATS

Bo Julius Oldenburg, Bjalbo, Lidingo, Sweden

Filed Jan. 20, 1975, Ser. No. 542,634
Claims priority, application Sweden, Jan. 23, 1974, 7400832; Nov. 6, 1974, 7413890
Int. Cl.² B63B *1/20*
U.S. Cl. 114—66.5 S 13 Claims



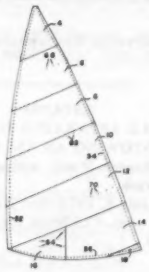
1. A bottom for planing boats comprising a plurality of steps located on said bottom, at least said steps on the rearward portion of said bottom being located substantially at the chine line of the bottom, said steps located on the forward portion of said bottom being spaced from the chine, the rearward portion of said steps being curved and the outward and forward portion thereof being substantially parallel to the keel of said bottom and the rearward and inward portion being spaced from said keel and being substantially perpendicular thereto, said curve of said step being a substantially smooth curve, and the maximum deflection of said curve being greater substantially at the middle portion of said steps, whereby the curve is substantially perpendicular at every point thereon to the direction of flow of water when the boat is planing.

3,974,791

SAILS AND METHOD OF MANUFACTURE

Stephen H. Haarstick, Ithaca, N.Y., and John W. Lynch, Annapolis, Md., assignors to Haarstick Sailmakers Chesapeake, Inc., Annapolis, Md.

Filed May 6, 1975, Ser. No. 574,931
Int. Cl.² B63H *9/06*
U.S. Cl. 114—103 13 Claims



11. An assembly of cloth panels for use in production of a racing one-design sailcraft sail comprising a plurality of woven synthetic fiber cloth panels fixed together at overlapped edges presenting a configuration representative of the desired completed sail, said assembly being characterized by:

A. constant width seam overlaps between adjacent panels and

B. small holes through each panel in the assembly marking fair curves for the luff, leech and foot of the sail to be formed from the assembly by stitching rolled edges on the assembly as defined by said holes.

3,974,792

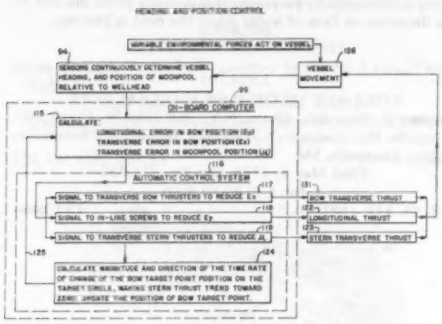
SEMI-SUBMERSIBLE, DIRECTIONALLY CONTROLLED DRILLING UNIT

Anthony John Burnell, and Robert Grant, both of San Francisco, Calif., assignors to Earl & Wright, San Francisco, Calif.

Filed Jan. 3, 1975, Ser. No. 538,393
Int. Cl.² B63H *25/00*
U.S. Cl. 114—144 B 23 Claims

1. A method for operating a floating vessel having propulsion means, the vessel being adapted to be semi-submersed in a body of water for maintaining the vessel in register with a given reference which is external to the vessel, including iteratively performing the steps of sensing the actual position of the vessel with respect to said reference, calculating a desired position of the vessel which is optimum for minimizing the power expended by the propulsion means in opposing the environmental forces acting on the vessel, said last step including calculating a target position of one end of the vessel at which registry of said one end results in the environmental forces coacting in equilibrium with the forces from the propulsion means to maintain the vessel at the desired position with a portion of the vessel in substantial register with the reference, sensing an error between the actual and desired posi-

tions, and operating the propulsion means responsive to the error to move the vessel to said desired position by moving said one end of the vessel into register with said target position.


HEADING AND POSITION CONTROL
VARIABLE ENVIRONMENTAL FORCES ACT ON VESSEL
SENSORS CONTINUOUSLY DETERMINE VESSEL HEADING, AND POSITION OF MOONPOOL RELATIVE TO WELLHEAD
VESSEL MOVEMENT
ON-BOARD COMPUTER
CALCULATE LONGITUDINAL ERROR IN BOW POSITION (Ex) TRANSVERSE ERROR IN BOW POSITION (Ey) TRANSVERSE ERROR IN MOONPOOL POSITION (Δ)
AUTOMATIC CONTROL SYSTEM
SIGNAL TO TRANSVERSE BOW THRUSTERS TO REDUCE Ey
SIGNAL TO IN-LINE SCREWS TO REDUCE Ex
SIGNAL TO TRANSVERSE STERN THRUSTERS TO REDUCE Δ
BOW TRANSVERSE THRUST
LONGITUDINAL THRUST
STERN TRANSVERSE THRUST
CALCULATE MAGNITUDE AND DIRECTION OF THE TIME RATE OF CHANGE OF THE BOW TARGET POINT POSITION ON THE TARGET SINGLE, MAKING STERN THRUST TREND TOWARD ZERO. UPDATE THE POSITION OF BOW TARGET POINT.

3,974,793

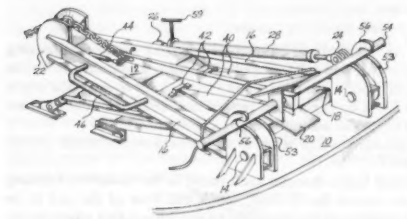
ANCHOR CRADLE APPARATUS FOR HANDLING AND STOWING AN ANCHOR

John Alan Aring, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed July 8, 1975, Ser. No. 594,170

Int. Cl.[2] B63B *21/22*

U.S. Cl. 114—210 **4 Claims**



1. An anchor-handling apparatus for a ship utilizing a deck anchor, comprising in combination:

a. a cradle structure pivotally mounted by pivot means along the ship's deck edge;

b. said cradle structure provided with holding means for holding said deck anchor when positioned in said cradle; said holding means including:

1. permanent retaining means such as a tension fitting connectedly engaging said cradle with said anchor and

2. hook means holding said anchor flukes in slideable connection to said cradle;

c. power-actuating means connected to said cradle for raising and lowering said cradle about said pivot means from a stowed flat deck position to an outboard slanted erected position and vice versa;

d. temporary retaining means such as a lashing line or the like for keeping said anchor to said cradle and for providing immediate dropping release of said anchor from said cradle in said slanted position when desired;

e. collapsible brace means connected between said deck and said cradle for holding and supporting said cradle in a predetermined angle when in said slanted outboard position, and

f. said pivot means provided with a cam surface for guiding said anchor by its anchor stock from and on said cradle in said cradle raising and lowering movements respectively, and said cam means provided with a hook portion to entrap said anchor stock for permanent fastening of said anchor in its stowed condition by said tension fitting means.

3,974,794

VACUUM ACTUATED SHIP MOORING DEVICES

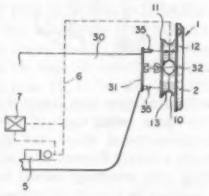
Shigeyuki Kakitani; Tadashi Kishi; Takehiko Hirao, all of Kure; Norimitsu Takami, Hiroshima; Atsumu Shimizu, Kure; Keiichi Outeki, Yokohama, and Masato Fujimoto, Kure, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1974, Ser. No. 520,100

Claims priority, application Japan, Nov. 3, 1973, 48-137955[U]; Nov. 6, 1973, 48-128400[U]; Nov. 6, 1973, 48-124779; Nov. 6, 1973, 48-128401[U]; Nov. 7, 1973, 48-128697[U]

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **4 Claims**



1. A device for mooring a ship comprising a mounting member, a suction cup assembly having a main body with two major surfaces, at least one continuous, circular lip rubber projecting outwardly from one major surface of said main body and defining a space in which a partial vacuum is produced by a vacuum pump when said suction cup assembly is attached to a surface of the ship, said suction cup assembly including a supporting member intermediate said mounting member and said main body, and means interconnecting the supporting member and said main body, means including a universal joint for supporting said suction cup assembly on said mounting member annd a plurality of power cylinders mounted on the mounting member and connected directly to the suction cup assembly whereby the assembly may be freely and positively moved in vertical and horizontal directions about said universal joint by actuation of said power cylinders, to position said suction cup assembly against the surface of the ship regardless of the curvature thereof.

3,974,795

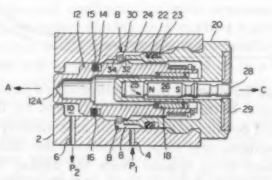
DIFFERENTIAL PRESSURE INDICATING DEVICE

Robert L. Crisp, Jr., Madison Heights, Mich., assignor to Facet Enterprises, Inc. Filter Products Division, Madison Heights, Mich.

Filed June 18, 1975, Ser. No. 587,935

Int. Cl.[2] G08B *5/00*

U.S. Cl. 116—114 PV **5 Claims**



1. A device for indicating a predetermined excessive differential level between inlet and outlet pressures comprising:

displaceable means displaceably arranged in a case and responsive to differential pressures communicated thereto through the case and including a piston carrying a magnetic member;

spring means arranged with the displaceable means and the case for retaining the displaceable means in a normal position when the differential pressure is below a predetermined excessive level.

the spring means releasing the displaceable means when the differential pressure is above the predetermined excessive level, whereupon the displaceable means is displaced in one sense;

other displaceable means in cooperative arrangement with the first mentioned displaceable means, and actuated for being displaced in an opposite sense upon the first mentioned displaceable means being displaced in the one sense for indicating that the differential pressure is above the predetermined excessive level;

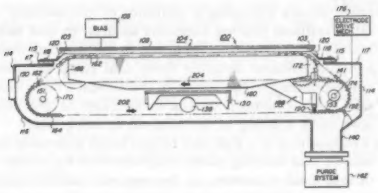
the other displaceable means including an indicating member carrying a magnetic member, with the poles of said magnetic member being in substantial repelling alignment with the poles of the magnetic member carried by the first mentioned displaceable means when said first mentioned displaceable means is in the normal position; and

the magnetic member carried by the other displaceable means being attracted by the magnetic member carried by the first mentioned displaceable means when said first mentioned displaceable means is released by the spring means and displaced in the one sense, whereupon the indicating member is displaced in the opposite sense for indicating the excessive differential pressure level.

3,974,796
DUAL MODE APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Gerald J. Murray, Jr., Arcadia, and Gordon U. Klingenberg, Bloomington, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1974, Ser. No. 525,697
Int. Cl.² G03G *15/08*
U.S. Cl. 118—4 **28 Claims**



1. An apparatus for selectively developing a latent electrostatic image formed on the surface of an insulating member in either a first or second mode, said insulating member overlying a conductive substrate, comprising:

a chamber having a pair of opposed sidewalls,

means for supporting said insulating member, said surface facing said chamber,

means for supplying a cloud of charged developer particles to said chamber through a port in one of said opposed sidewalls,

means for supplying gas to said chamber through a port in the other of said opposed sidewalls,

means overlying said ports through which said developer particles and said gas are introduced into said chamber whereby said gas and developer particles are mixed and are directed thereto to said insulating surface for a predetermined time period to develop said latent electrostatic image,

a development electrode positioned between said insulating surface and said overlying means, said development electrode adapted for movement in said first development mode past said insulating surface during said development period, said development electrode being stationary in said second development mode and out of operable relationship with said insulating member,

drive means for moving said development electrode past said insulating surface in said first development mode,

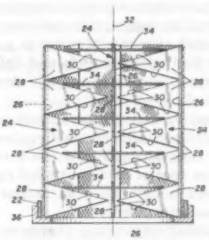
means responsive to signals external to said apparatus for selecting either said first or second development modes, and

means for biasing said conductive substrate to a predetermined polarity whereby said latent electrostatic image is developed in the selected mode.

3,974,797
APPARATUS FOR APPLYING A FILM OF MATERIAL TO SUBSTRATES OR SLICES

Jearld L. Hutson, 2019 W. Valley View Lane, Dallas, Tex. 75234

Filed July 8, 1974, Ser. No. 486,449
Int. Cl.² B05C *13/02, 5/00, 3/02*
U.S. Cl. 118—54 **7 Claims**



1. Apparatus for simultaneously applying light sensitive material to a plurality of semiconductor slices which comprises:

a hollow, cylindrical supporting fixture formed from an open material;

a plurality of slice supporting members mounted on and within the supporting fixture and extending radially inwardly with respect thereto, each of said slice supporting members comprising a plurality of knife edges each extending angularly with respect to the radius and with respect to the axis of the fixture for supporting a plurality of semiconductor slices by means of point contact;

said plurality of slice supporting members defining a plurality of axially spaced sets each including at least three angularly extending knife edges;

the knife edges of each set extending at substantially the same angle for supporting slices in a generally radial orientation;

said semiconductor slices when supported by said knife edges being stacked in a spaced apart array extending along the axis of the fixture;

means for simultaneously applying light sensitive material to the entire surface areas of all of the semiconductor slices supported by the knife edges within the fixture; and

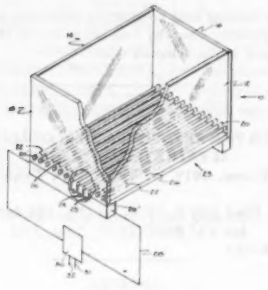
means for rotating the fixture about its axis at a predetermined rate and for a predetermined time so that a predetermined thickness of the light sensitive material is uniformly exposed over the entire surface area of each semiconductor slice.

3,974,798

METHOD AND APPARATUS FOR STUDYING LABORATORY ANIMAL BEHAVIOR

Murray O. Meetze, Jr., 2742 Gervais St., Columbia, S.C. 29204

Filed Apr. 21, 1975, Ser. No. 569,599
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **19 Claims**



12. An animal activity monitoring unit comprising:

a. a walled animal enclosure, said enclosure having a plurality of elongated elements secured to a portion of said enclosure wall at opposite ends and defining a floor of said enclosure, at least certain of said elongated elements being electrically conductive;

b. resistors of predetermined value being connected across each adjacent electrically conductive element, and cooperating with said elements to define a resistor network, whereby upon receipt of a controlled current supply, a voltage change occurs when an animal makes contact with said conductive elements;

c. means to convert said voltage change to a pulse; and

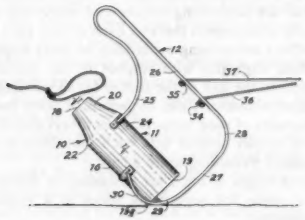
d. means to manipulate said pulse to be compatible input for a particular pulse recording system, said means being connectable to said particular system.

3,974,799

CALF ROPING TRAINING AID

Donald Parsons, Rte. 5, Box 143, Walla Walla, Wash. 99362

Filed June 2, 1975, Ser. No. 583,119
Int. Cl.² F41J *9/00*
U.S. Cl. 273—105.2 **7 Claims**



1. A calf roping training aid adapted to be towed along the ground in a forward direction as a roping target for a calf roper, comprising:

a simulated calf body with forward and rearward facing ends;

a longitudinal bottom side normally facing downwardly and a longitudinal top side normally facing upwardly;

a hornless head portion at the forward body end adapted to receive and slidably release the loop of a lariat, said head portion tapering forwardly from the forward body end to a reduced nose end;

means for movably supporting the body in a loop receiving position above ground with the body and head portion oriented substantially parallel to the ground surface and with the bottom side facing the ground surface;

rocker means responsive to rearward force directed against the forward body end while the aid is being towed in a forward direction for rocking the body and head portion rearwardly about a horizontal axis to bring the top side to a downwardly facing condition and the head to a rearwardly facing loop releasing position; and

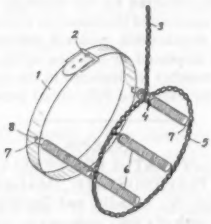
return means responsive to forward pulling force for rocking the body and head portion back to the loop receiving position.

3,974,800

RESTRAINING DEVICE FOR DOGS AND OTHER ANIMALS

Abraham Halperin, 102-36 64th Ave., Forest Hills, N.Y. 11375

Filed Jan. 20, 1975, Ser. No. 542,501
Int. Cl.² A01K *27/00*
U.S. Cl. 119—106 **6 Claims**



1. A restraining device for an animal, comprising:

a flexible strap fastenable around an animal's neck near its body;

spacing means including a plurality of transversely separated resilient bracing elements secured to said strap;

a flexible leash extension anchored to said spacing means at a predetermined distance from said strap substantially corresponding to the length of the animal's neck whereby said leash extension comes to lie close to the animal's jaws upon a fitting of the strap to its neck; and

an eye fastened to a free end of said leash extension on one side of said spacing means and traversed by another part of said leash extension on the opposite side of said spacing means whereby said leash extension forms a tightenable loop about the animal's neck in the vicinity of the jaws.

3,974,801

OSCILLATING PISTON INTERNAL COMBUSTION ENGINE

Jesse C. Brown, 307 Walter Ave., Delanco, N.J. 08075

Filed Apr. 3, 1975, Ser. No. 564,782
Int. Cl.² F02B *53/00*
U.S. Cl. 123—18 R **10 Claims**

1. An internal combustion engine, comprising:

an engine block,

at least one pair of cylinders mounted in tangentially-opposed relation on diametrically opposite sides of an axis through the block,

means mounting said cylinders for rotation in a bank in unison in a substantially annular path about said axis with one end of each cylinder leading and the other end trailing,

a double-acting piston displaceable axially in each cylinder between opposite ends thereof,

means mounting said pistons for axial movement in said cylinders and for rotation in unison about said axis,

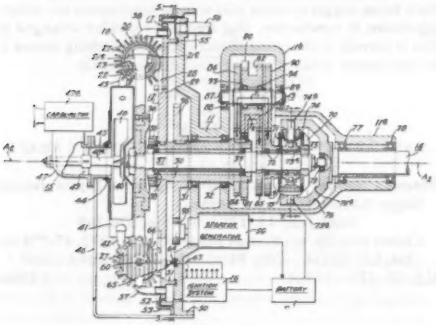
means for alternately admitting a combustible mixture to the leading ends and to the trailing ends of the cylinders,

means for igniting said combustible mixtures in timed relation with the rotation of the cylinders about said axis,

means for exhausting the ignited mixture from said cylinders as they rotate about said axis,

an output shaft journalled in said engine block, and

gearing means in said engine block directly connecting said cylinder mounting means and said piston mounting means together and to said output shaft for affording controlled relative motion between the pistons and the cylinders and for converting said relative motion into unidirectional



rotation of said output shaft said gearing means including a differential gear assembly having a pair of input ring gears rotatable relative to one another, a pair of output planetary gears engaging said ring gears, and a yoke connected to said output shaft and rotatably mounting said planetary gears, a first gear train connecting one of said input ring gears to said cylinder mounting means, a second gear train connecting the other of said input ring gears to said piston mounting means, one of said gear trains including a complementary pair of sector gears interengaged with one another, one of said pair of sector gears being rotatable in synchronism with said cylinder mounting means and the other of said pair of sector gears being rotatable in synchronism with said piston mounting means, whereby the sector gears cooperate with the gear trains to impart unidirectional output torque to said output shaft.

3,974,802

INTERNAL COMBUSTION ENGINE

Hendrik W. Lundquist, Sunland, Calif. 91352

Continuation-in-part of Ser. No. 389,372, Aug. 17, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,367

Int. Cl.² F02D *19/00*

U.S. Cl. 123—25 R **6 Claims**

1. An air cooled internal combustion engine, having at least one combustion chamber, said combustion chamber having cooling fins located on the exterior thereof, comprising:

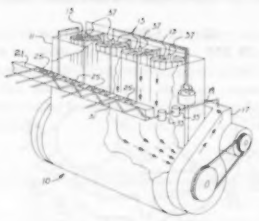
means for admitting fuel into each combustion chamber;

means for preheating said fuel prior to entering each combustion chamber to enable said fuel to vaporize as it enters said combustion chamber, said means for preheating said fuel comprising a heat exchanger positioned within the exhaust manifold of the engine;

means for admitting water into each combustion chamber;

means for preheating said water prior to entering each combustion chamber to enable said water to vaporize as it enters said combustion chamber, said means for preheating said water comprising a heat exchanger positioned within the exhaust manifold of the engine; and

means for admitting air into each combustion chamber and means for preheating the air prior to entering said com-



bustion chamber, said means comprising a fan for drawing air through an area adjacent the cooling fins of the combustion chamber and forcing said air heated by contact with the fins into said air admitting means.

3,974,803

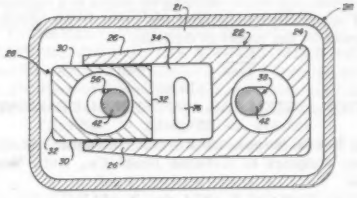
INTERNAL COMBUSTION ENGINE WITH GYRATORY PISTON AND CYLINDER MOVEMENT

Marek J. Lassota, 4132 W. Roscoe St., Chicago, Ill. 60641

Continuation-in-part of Ser. No. 221,198, Jan. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 361,472, May 18, 1973, abandoned, and a continuation-in-part of Ser. No. 425,507, Dec. 17, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,613

Int. Cl.² F02B *59/00*

U.S. Cl. 123—42 **13 Claims**



1. A prime mover in which piston and cylinder-piston elements follow gyratory paths in executing power generating cycles, including

a cylinder-piston element having a body and spaced, parallel rectilinear flat sidewalls,

a piston element having spaced, parallel sides adjoining and coacting with said cylinder-piston rectilinear sidewalls, said piston and cylinder-piston elements partly forming a polyhedron variable volume chamber, in which fluid pressures operate to expand and contract said chamber,

stationary rectilinear flat housing parts adjoining and coacting with opposite sides of the said cylinder-piston and piston elements to further define said polyhedron combustion chamber,

a rotatable cylinder-piston crankshaft mounted in said cylinder-piston body,

an oppositely rotatable piston crankshaft mounted in said piston element, and

gearing means interconnecting said crankshafts so that said piston and cylinder-piston elements follow opposite and coordinated gyratory paths.

2. A prime mover as in claim 1 wherein said prime mover is an internal combustion engine operated by hydrocarbon fuels, and said chamber is a combustion chamber.

3,974,804

EXPLOSION ENGINE WITH SEVERAL COMBUSTION CHAMBERS

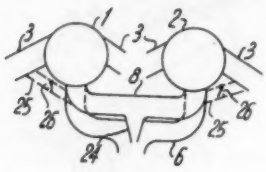
Remi Curtil, Zurich, Switzerland, assignor to Motosacoche S.A., Geneva, Switzerland

Filed Sept. 18, 1974, Ser. No. 507,250

Claims priority, application Switzerland, Sept. 26, 1973, 13807/73

Int. Cl.² F02C 75/20

U.S. Cl. 123—59 BM 6 Claims



1. In an explosion engine comprising a plurality of combustion chambers, at least one mobile member submitted to the pressures in said chambers, and means for setting up a temporary communication between two of said chambers which periodically have an overlap during periods at the beginning of an exhaust phase for one of said two chambers and the end of an intake phase of the other of said two chambers to employ the residual energy of exhaust gases in said one chamber to supercharge said other chamber at the end of its intake phase, said temporary communication means comprising a fixed conduit, each of said chambers having ports therein, said conduit having two ends each leading into a respective port, said ports disposed so as to be uncovered by said at least one mobile member during said periods, means for scavenging said conduit between said periods, fresh air inlet conduits communicating with each chamber, means connecting said ends of said temporary communication conduit with said fresh air inlet conduit, and means defining an orifice at a medium part of said temporary communication conduit for removal of burnt gases by the supply of fresh air.

3,974,805

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

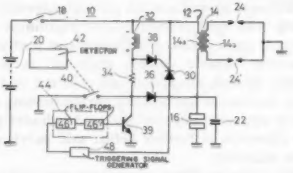
Tetsuya Kondo, Susono, and Takeshi Watanabe, Fuji, both of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Oct. 9, 1974, Ser. No. 513,471

Claims priority, application Japan, Oct. 15, 1973, 48-114674

Int. Cl.² F02P 9/00, 3/00

U.S. Cl. 123—118 9 Claims



1. An ignition system for an internal combustion engine which system includes a power supply and an ignition circuit including an ignition coil having a primary coil portion connected to said power supply and a secondary coil portion connected to at least one ignition plug, said ignition plug disposed within an operating chamber of an engine, a contact breaker to be operated at the ignition time intervals at which ignition is expected for normal operation of the engine, and said contact breaker is connected to said primary coil portion, said ignition system characterized by a triggering signal generator to generate a triggering signal each time said contact breaker is operated; a frequency divider to divide said triggering signal from said triggering signal generator so as to produce a divided signal with the frequency of 1-n times the frequency of said triggering signal wherein n is 2 or 4; an overriding means to periodically override said ignition circuit in response to said divided signal, so that ignition of the engine is caused to fail periodically; and means to allow the operation of said overriding means responsive to conditions requiring failure of ignition of the operating chamber, said overriding means comprising first semiconductor switching means connected in parallel to said primary coil portion of said ignition coil whereby the primary voltage across said primary coil portion is short-circuited when said semiconductor switching means is conductive, and second semiconductor switching means to prevent said first semiconductor switching means from being triggered when said second semiconductor switching means is conductive, said frequency divider arranged so that it permits said second semiconductor switching means to be conductive when it outputs said divided signal.

3,974,806

GAS LABYRINTH CARBURETOR THROTTLE SHAFT SEAL

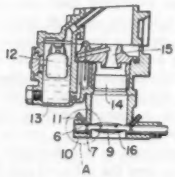
Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 15, 1973, Ser. No. 370,208

Claims priority, application Japan, Aug. 4, 1972, 47-77678

Int. Cl.² F02M 17/00; F16C 1/24, 33/80; F16J 15/40

U.S. Cl. 123—119 R 1 Claim

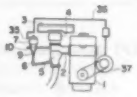


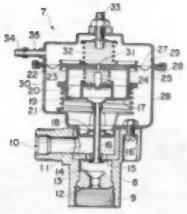
1. In a carburetor comprising a tubular wall member forming a flow passageway including a venturi and a mixing chamber, a throttle valve located within the flow passageway, said throttle valve including a throttle shaft, wherein the improvement comprises that said tubular wall member forms a bore-like bearing section opening into the flow passageway, said throttle shaft supported in said bore-like bearing section, means for preventing the admission of alien substances into said bearing section about said shaft, said means including an annular slot extending in the circumferential direction about said throttle shaft and formed in said shaft, means for introducing compressed air through said tubular wall member from the exterior of the carburetor into said slot for distribution of the compressed air from said slot between said throttle shaft and said bearing section so that the flow of compressed air forms a gas lubricated bearing therebetween and prevents alien substances, such as dust, moisture and the like, from entering into said bearing section, and a labyrinth formed in said throttle shaft within said bearing section and spaced axially of said throttle shaft from said slot and located on the opposite side of said slot from the flow passageway for controlling the air flow rate between said shaft and said bearing section.

3,974,807
FLOW CONTROL VALVE ASSEMBLY FOR EXHAUST GAS RECIRCULATION SYSTEM

Hidetaka Nohira, and Masaaki Tanaka, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 11, 1975, Ser. No. 567,192
Claims priority, application Japan, Apr. 16, 1974, 49-41651
Int. Cl.² F02M *25/00*
U.S. Cl. 123—119 A **7 Claims**





1. In an exhaust gas recirculation system for partially recirculating the exhaust gases from an exhaust system to an intake system of an internal combustion engine wherein the improvement comprises:

a flow control valve assembly comprising: an inlet port having fluid communication with the exhaust system; an outlet port having fluid communication with the intake system; first valve means interposed between said inlet port and said outlet port and including an orifice, a valve seat formed downstream of said orifice, a constant-pressure chamber defined between said orifice and said valve seat, and a first valve member movable between a seated position and an open position for regulating the effective area of a flow passage of the exhaust gases between itself and said valve seat; first diaphragm means for moving the first-named valve member, said diaphragm means including a first diaphragm connected to the first-named valve member and movable together with the same when the pressure difference thereat exceeds a predetermined level, an air source under pressure a diaphragm chamber defined by the first-named diaphragm and having fluid communication with an air source under pressure, and an air bleed hole formed in the first-named diaphragm; and second valve means including a second valve member movable between a seated position and an open position in response to the pressure in said constant-pressure chamber for regulating the effective area of said air bleed hole, so that the amount of air bleed under pressure from said diaphragm chamber may be controlled by the second-named valve member to maintain the pressure of the exhaust gases in said constant-pressure chamber substantially at the atmospheric level.

3,974,808
AIR INTAKE DUCT ASSEMBLY

John S. Heitert, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 2, 1975, Ser. No. 592,843
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 D **4 Claims**

1. An air intake duct assembly for an internal combustion engine air cleaner,

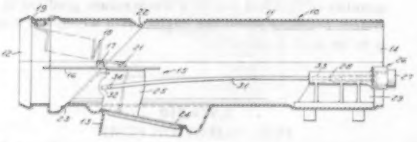
the duct assembly including a duct having an ambient air inlet, a branch exhaust manifold heated air inlet and an air discharge outlet adapted to be coupled to an air cleaner,

a flap valve pivotally mounted within the duct,

the flap valve being movable relative to the air inlets to proportion the flow of ambient and heated air through the duct,

spring means normally biasing the flap valve toward an ambient air inlet closed position,

and a longitudinally expandable-contractible temperature responsive element in the air duct contiguous to the discharge outlet for sensing the temperature of air flowing therethrough,



wherein the improvement comprises:

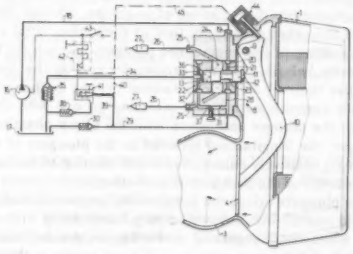
an axially loaded spring steel driveshaft coupling the temperature responsive element to the flap valve to bias the latter against the resistance of the spring means from the ambient air inlet closed position toward the heated air inlet closed position as the temperature of the air flowing through the duct reaches a predetermined value,

the driveshaft being constructed and arranged so that upon the flap valve reaching a heated air inlet fully closed position the driveshaft will buckle laterally to accommodate overtravel of the temperature responsive element if the latter continues to expand.

3,974,809
FUEL INJECTION SYSTEM FOR SPARK PLUG-IGNITED INTERNAL COMBUSTION ENGINES WITH COMPRESSION OF THE AIR-FUEL MIXTURE

Gerhard Stumpp; Günther Jäggle; Rudolf Krauss, all of Stuttgart, and Herbert Scharl, Ditzingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 27, 1974, Ser. No. 446,406
Claims priority, application Germany, Mar. 16, 1973, 2313164
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AW **14 Claims**



1. A fuel injection system for use with spark plug-ignited internal combustion engines with compression of the air-fuel mixture, the fuel having a vapor pressure which is determined by the temperature of the engine with which the system is to be used, the system including:

a. means through which fuel for injection is delivered, for regulating a fuel injection quantity operating in depen-

dence on the air quantity drawn into the engine with which the system is to be used;

b. a pressure regulator means for determining normal system pressure;

c. a plurality of injection nozzles connected to said regulating means for receiving the regulated fuel injection quantity, said nozzles having an opening pressure lower than the system pressure;

d. a continuously delivering fuel pump for delivering fuel to said regulating means; and

e. means for adjusting said fuel regulating means so that the starting pressure in the system is retained below the opening pressure of the injection nozzles and above the vapor pressure of the fuel until a quantity of fuel has been restored in the system which is sufficient to replace the quantity of fuel lost due to a temperature gradient in the system resulting when the engine with which the system is to be used is cut off.

3,974,810

FUEL INJECTION PUMP

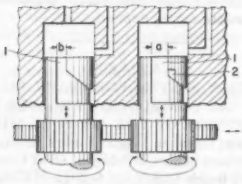
Kenichi Yajima, Kawagoe, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1974, Ser. No. 463,722

Claims priority, application Japan, May 1, 1973, 48-50172[U]

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 R **1 Claim**



1. In a fuel injection pump of the type having two sets of plungers commonly rotatably displaceable and having metering grooves for cooperating with a pump port such that the plungers of one set cease supplying fuel to their associated engine cylinders during idling of an engine, whereas the plungers of the other set supply fuel to their associated cylinders during idling of the engine, the plungers of each set having a generally helical metering groove formed in the cylindrical surfaces thereof, and a longitudinal groove in the cylindrical surface communicating said metering groove with the upper end of the plunger and hence with the pump chamber of the plunger, the longitudinal grooves in the plungers of said one set being relatively enlarged in width relative to the longitudinal grooves of the plungers of said other set such that rotation of the plungers brings the longitudinal groove of each plunger of said one set into a non-pumping relationship with its pump port when the plungers of said other set are in their engine-idling fuel delivery positions, and a cut recess at the intersection of the longitudinal groove and the helical groove of each plunger of said first set, each said cut recess extending at a right angle to its longitudinal groove between the cylindrical surface of its plunger and the opening of the recess into its longitudinal groove, the upper end of each said recess being closed, the lower end opening into said helical groove and the floor of each recess being oriented such that the depth of the recess increases toward the longitudinal groove.

3,974,811

FUEL INJECTION SYSTEM

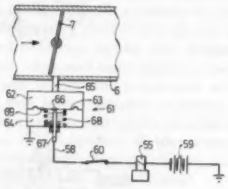
Gerhard Stumpp, Stuttgart; Friedbert Michel, Kornwestheim, and Josef Steiner, Esslingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

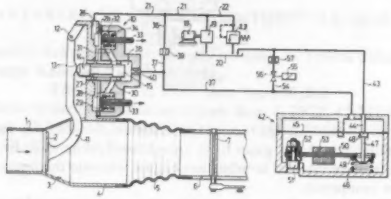
Filed Jan. 3, 1975, Ser. No. 538,404

Claims priority, application Germany, Jan. 24, 1974, 2403276

Int. Cl.² F02M *69/00*

U.S. Cl. 123—139 AW **12 Claims**





1. A fuel injection system for mixture-compressing externally ignited internal combustion engines employing continuous fuel injections comprising, in combinations:

a. an induction tube into which fuel is to be continuously injected;

b. a measuring member positioned within said induction tube for moving as a function of the air flow rate therein;

c. an arbitrarily actuable, throttle butterfly valve disposed within said induction tube, said measuring member and said butterfly fly being disposed sequentially;

d. a fuel metering and quantity distribution valve assembly including a fuel passage, a movable part disposed in the fuel passage, said valve assembly being coupled to said measuring member and controlled thereby for metering out a fuel quantity in proportion to the air flow rate in said induction tube;

e. means for providing a restoring force, which acts in opposition to the force provided by the air flow in the induction tube, to said measuring member including:

1. at least one pressure control valve controllable in dependence on at least one engine operating parameter;

2. a control pressure circuit having said control valve therein;

3. means for supplying pressurized fluid to said control pressure circuit; and

4. a control slide formed by the movable part of the fuel metering and quantity distribution valve assembly, said control slide being acted upon by the fluid in said control pressure circuit coupled to said measuring member for transmitting the restoring force thereto;

f. at least one movable heatable control element operable in dependence on temperature and at least one spring forming part of said at least one pressure control valve, said control element acting in opposition to the force of said spring when at least one operating temperature of the engine is below normal running temperature;

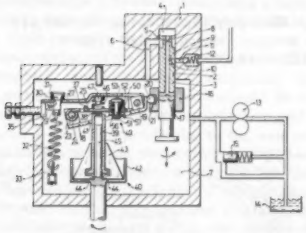
g. an electrical heating means for heating said control element;
h. valve means coupled to said pressure control circuit and responsive to movement of said butterfly valve for reducing the pressure of the pressurized fluid in said control circuit during engine warm-up phase when the engine is suddenly accelerated; and
i. an electromagnet provided for controlling the valve means.

3,974,812

SPEED REGULATOR FOR FUEL INJECTION PUMPS

Karl Konrath, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 3, 1975, Ser. No. 538,469
Claims priority, application Germany, Jan. 18, 1974, 2402374
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 ST 10 Claims



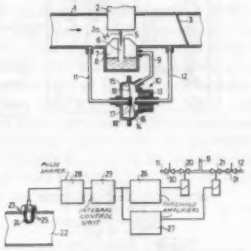
1. In a speed regulator for use with fuel injection pumps of internal combustion engines including an intermediate lever pivotable about a fixed axis defined by a shaft, said intermediate lever being coupled to a fuel quantity adjustment member of a fuel injection pump, and a speed responsive signalling device which generates a speed dependent force acting against an arbitrarily variable force of a main control spring and a force of a starting spring, the improvement comprising:
a. A one-armed adjustment lever pivotably attached to said intermediate lever at an attachment point spaced from said fixed axis, said speed signalling device being in contact with one surface of said adjustment lever and said starting spring being in contact with another surface of said adjustment lever so as to act in opposition to force applied by said device;
b. a one-armed drag lever having a free end and pivotably mounted at its other end for pivoting about said fixed axis defined by said shaft to which said intermediate lever is attached;
c. an adjustment capsule carried by said adjustment lever near its free end for engagement with said drag lever;
d. an adjustable stop positioned in the vicinity of said free end of said drag lever for limiting pivoting of said drag lever in one direction, said main control being attached to said drag lever near its said free end; an d
e. a further stop, carried by said adjustment lever and projecting in the direction of said drag lever for engagement therewith, wherein:
i. said further stop is located between the area of contact of said speed signalling device and the attachment point of said adjustment lever to said intermediate lever; and
ii. the area of contact of said speed signalling device is located between the area of engagement of said adjustment capsule with said drag lever and the attachment point of said adjustment lever to said intermediate lever.

3,974,813

FUEL METERING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Heinrich Knapp, Leonberg-Silberberg; Johannes Bretschneider, Ludwigsburg-Pflugfelden, and Lorenz Bundesen, Flensburg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 29, 1973, Ser. No. 392,659
Claims priority, application Germany, Aug. 29, 1972, 2242345; Aug. 1, 1973, 2338875
Int. Cl.² F02D *1/04*
U.S. Cl. 123—140 MC 20 Claims



1. A fuel-metering system adapted for attachment to an air-intake suction tube, having a throttle passage therein, of an internal combustion engine having an exhaust for waste gases, which system comprises:
a. a fuel reservoir adapted for having an airspace above the fuel therein;
b. means for measuring the air pressures in said airspace and said suction tube and for metering fuel amounts to be introduced into given amounts of air flowing through said suction tube, in dependence on said air pressures, and
c. means for varying the air pressures prevailing in said airspace, in dependence on characteristic engine data, which air pressure-varying means comprise:
i. first conduit means for connecting said airspace with said suction tube upstream of the throttle passage of the latter,
ii. second conduit means for connecting said airspace with said suction tube downstream of said throttle passage,
iii. an output signal-emitting measuring probe for detecting the composition of the exhaust waste gases of said internal combustion engine, and
iv. valve means for controlling the cross-sectional areas of said first and second conduit means in dependence on output signals emitted by said measuring probe, by increasing one of said cross-sectional areas and correspondingly decreasing automatically the other cross-sectional area, thereby varying the pressure in said airspace.

3,974,814

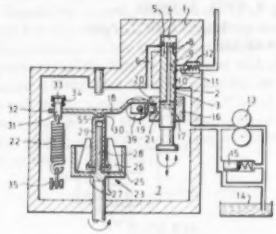
SPEED REGULATOR FOR FUEL INJECTION PUMPS

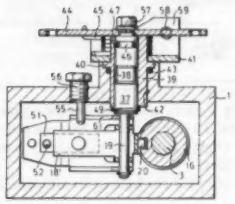
Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 7, 1975, Ser. No. 539,250
Claims priority, application Germany, Jan. 23, 1974, 2403081
Int. Cl.² F02M *39/00;* F02D *1/04*
U.S. Cl. 123—139 ST 4 Claims

1. In a speed regulator for fuel injection pumps of internal combustion engines having a speed regulating device which includes: a housing; at least one intermediate lever; a pin eccentrically disposed on a shaft mounted to the housing, said intermediate lever being pivotably mounted to the housing by said pin; full load fuel quantity stop means; a speed signalling

device mounted to the housing and in engagement with the intermediate lever for transferring thereto a control function; a main control spring connected to one end of the intermediate lever, with the other end of the intermediate lever being coupled to a flow quantity adjustment member of a fuel injection pump, said intermediate lever being pivotable about said pin, as far as the stop means for limiting the full load fuel quantity, the improvement comprising a bushing including an





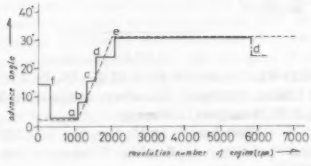
eccentrically disposed bore within which said shaft is inserted for adjusting the axis about which the intermediate lever is pivotable, said shaft being rotatable and arrestable externally of the housing, wherein the stop means for limiting the maximum full load fuel quantity and the speed signalling device are vertically spaced by the same amount from the flow quantity adjustment member for retaining the position of the stop means without affecting the working capacity of the speed signalling device.

3,974,815

SIGNAL SOURCE FOR USE IN A BREAKERLESS IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Mitsuo Katsumata, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Feb. 3, 1975, Ser. No. 546,729
Claims priority, application Japan, Feb. 6, 1974, 49-15245
Int. Cl.² F02P *5/04, 1/00*
U.S. Cl. 123—148 CC **8 Claims**



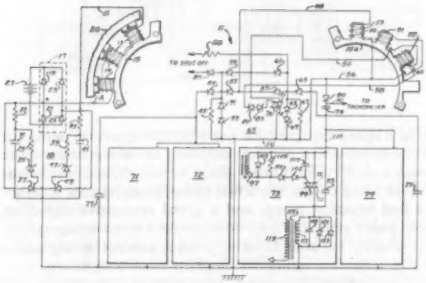
1. A signal source for use in a breakerless ignition system for an internal combustion engine, comprising a rotor having at least one pair of magnetic poles and a stator having a plurality of normally igniting signal coils arranged so that they produce respective ignition timing signals at respective ignition points slightly different from each other, said normally igniting signal coils being operatively associated with a breakerless ignition system so that the ignition timing signals are supplied thereto and having said respective ignition timing signals selectively applied in response to increase in the revolution speed of an internal combustion engine, said signal source characterized by that said stator further comprises a starting signal coil positioned so as to produce a starting signal at an ignition point slightly advanced in phase relative to the ignition timing signals from some of said normally igniting signal coils relatively retarded in phase and operated when said engine is started at a relatively lower speed, said starting signal coil operatively associated with said breakerless ignition system so that said starting signal is supplied thereto; and comprising switching means associated with said starting signal coil to hold said starting signal from said breakerless ignition system when the starting of said engine is completed.

3,974,816

ELECTRONIC IGNITION SYSTEM WITH COMBINED OUTPUT FROM MULTIPLE COILS

Robert M. Henderson, Williams Bay; Richard Zechlin, Beloit, both of Wis., and K. Narasimha Reddy, Highland, Ill., assignors to Colt Industries Operating Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,410
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 CC **1 Claim**



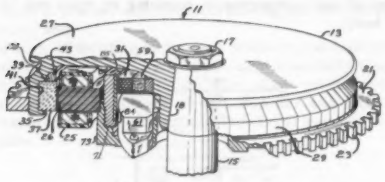
1. An electronic control system for a spark ignition engine including means for energizing a plurality of electronic triggering circuits in timed spaced intervals, comprising first and second coil means, magnetic means interacting with said coils for generating an AC voltage, said first coil means having a relatively high number of turns and said second coil means having a relatively low number of turns, at least first and second storage capacitor means, the output from said first coil means being connected to said first and second storage capacitor means and being primarily effective to charge said first and second storage capacitor means when said engine is operating at a relatively low rate of speed, and the output from said second coil means being connected to said capacitor means and being primarily effective to charge said capacitor means when said engine is operating at a relatively high rate of speed, circuit means for combining the output from said first and second coil means for charging said first and second storage capacitor means to a selected level throughout essentially the entire operating range of the engine, and means connecting the output of said coil means to charge one of the storage capacitor means to one polarity and the other of the storage capacitor means to the other opposite polarity, said first and second storage capacitor means being isolated from each other and having isolated charging and discharging action and separate switching means.

3,974,817

BREAKERLESS IGNITION CONTROL SYSTEM

Robert M. Henderson, Williams Bay, and Richard Zechlin, Beloit, both of Wis., assignors to Colt Industries Operating Corporation, New York, N.Y.

Filed July 18, 1974, Ser. No. 489,552
Int. Cl.[2] F02P 1/02, 5/02
U.S. Cl. 123—149 C 7 Claims



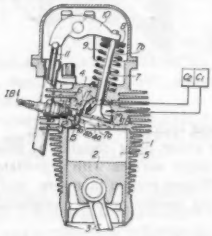
1. An ignition system for controllably providing energy to fire the spark plugs of an associated engine, said system comprising, in combination a flywheel comprising a capped cylinder with axially depending walls, said flywheel being mountable on a shaft operable by the engine, magnets mounted along the inner surface of the cylindrical walls of the flywheel, stator assemblies and electronic component assemblies formed as portions of a circle positioned around the axis of the flywheel, substantially in circular configuration and substantially adjacent a plane, perpendicular to the axis said stator assembly including, a timing ring having pole pieces formed thereon, said ring being adjustably mounted within the periphery of said flywheel, a rotor assembly including magnet means mounted centrally on said flywheel and rotatable therewith, said rotor assembly positioned within the periphery of said timing ring and forming an air gap therebetween, and a stationary triggering coil assembly mounted within the periphery of said timing ring, said rotor assembly interacting with the pole pieces of said timing ring and said trigger coils to provide a trigger pulse for the associated engine spark plugs whereby the foregoing assemblies and said ring mounted within the walls of the flywheel adjacent the capped portion to thereby obtain a compact ignition system which is protected and shielded by said flywheel.

3,974,818

INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 17, 1974, Ser. No. 434,216
Claims priority, application Japan, Jan. 22, 1973, 48-9748; Feb. 27, 1973, 48-23919; Mar. 8, 1973, 48-27277; Apr. 3, 1973, 48-38467; Oct. 31, 1973, 48-123227
Int. Cl.[2] F02B 19/10, 19/16
U.S. Cl. 123—32 SP 18 Claims



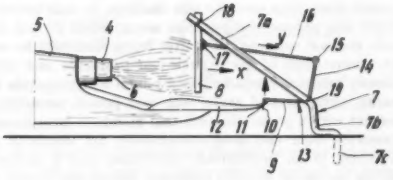
1. An internal combustion engine comprising: a cylinder, a cylinder head cooperating with said cylinder to define a main combustion chamber, an intake valve having a valve stem and a valve head connected thereto, a suction port for introducing a lean air-fuel mixture to said main combustion chamber, a trap chamber disposed in said cylinder head for receiving a rich mixture to provide a torch jet ignition and having at least one suction aperture through which the rich mixture is supplied into said trap chamber when said intake valve is opened, said trap chamber also having at least one discharge aperture, all of said suction and discharge apertures being small enough to effect the torch jet ignition, said suction and discharge apertures always being in communication with said main combustion chamber during the time when said intake valve is kept closed so that the torch jet can spurt through said both apertures, and so that during the compression stroke, the pressure at said suction and said discharge aperture is substantially equal thereby preventing a substantial portion of said rich mixture received in said trap chamber from escaping therefrom, a spark plug having a set of electrodes exposed to said trap chamber, a suction passage for feeding the rich mixture to said suction port, said passage having an open end disposed in said suction port so that the rich mixture is introduced therefrom into said trap chamber when said intake valve is opened, and means provided between said suction and discharge apertures in said trap chamber for partially dividing said trap chamber thereby facilitating the introduction of the rich mixture through said suction aperture to said set of electrodes and holding said mixture thereat.

3,974,819

STARTING DEVICE FOR A ROCKET AIRCRAFT FOR PLAYING OR LEARNING PURPOSES

Hans Held, 8121 Wessobrunn-Haid, Germany

Filed Oct. 31, 1974, Ser. No. 522,703
Claims priority, application Germany, Nov. 2, 1973, 2354965
Int. Cl.[2] F41B 7/00
U.S. Cl. 124—17 4 Claims



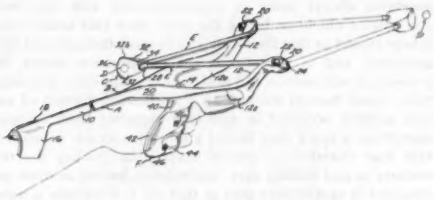
1. A starting device for a toy aircraft having a front end and a rear end, comprising, a rocket motor adapted to be mounted on the toy aircraft in the region of its rear end and having a rearwardly directed propulsion gas discharge aperture having a longitudinal axis adapted to extend lengthwise of the toy aircraft; a stretched elastic pull element releasably connectable to the front end of the toy aircraft; and holder means for temporarily holding the toy aircraft stationarily against the combined force of said rocket motor and said pull element and including a stationary holder, a hook-shaped locking element movable between a locking position in which it engages the toy aircraft in the region of its rear end and a releasing position, a control plate pivotally mounted in the region of one end thereof on said holder rearwardly of the discharge aperture and normally extending substantially normal to the longitudinal axis thereof and movable from said normal to an inclined position when propulsion gas emanating from said discharge aperture impinges thereon, and linkage means pivotally mounted on said holder and connected to said control plate and said locking element for moving the latter to said releasing position upon movement of said control plate to said inclined position so that the toy aircraft may start under the combined action of said rocket motor and said pull element.

3,974,820

CATAPULT DEVICE

Peter Paul Ott, 237 Canyon Acres Drive, Laguna Beach, Calif. 92651

Filed Mar. 10, 1975, Ser. No. 556,662
Int. Cl.² F41B 7/00
U.S. Cl. 124—20 R **5 Claims**



1. A portable hunting catapult device that may be carried by a user, said device of the type that includes a pouch having two spaced sidewalls capable of having a projectile disposed therebetween, two elongate laterally spaced elastomeric members that are secured to said side walls and extend forwardly therefrom, said members having forwardly disposed enlarged first end portions, as well as second end portions, and a wishbone shaped frame that includes an elongate shank having first and second ends and two laterally spaced arms that project forwardly from said first end, the improvement in said frame that includes:

a. two heads mounted on the forward extremities of said arms, said heads including external and interior side surfaces and forwardly disposed end surfaces, said heads having longitudinal bores therein that have funnel shaped rearward portions of such transverse cross section that said enlarged first end portions cannot pass therethrough when said elastomeric members extend forwardly through said bores to extend transversely across said end surfaces and then rearwardly along said exterior side surfaces to said pouch to which said second end portions are attached to said sidewalls thereof, said members after being tensioned by rearward movement of said pouch and projectile and subsequently released propelling said pouch and projectile forwardly between said arms, with said pouch remaining in contact with a projectile until said members have traveled forwardly from said arms substantially the length of said members in an untensioned condition, and a projectile having maximum velocity imparted thereto due to remaining in contact with said pouch for the maximum distance of travel;

b. a pistol type handle that depends from said shank rearwardly of said arms;

c. a cross piece supported from said second end of said shank that is forced into pressure contact with the forearm of a user when the hand associated with said forearm grasps said handle and said pouch is pulled rearwardly to tension said members;

d. two laterally spaced flanges that depend from said arms and that are pressure contacted by a thumb and forefinger of a user when a hand grasps said handle; and said shank is of arcuate transverse cross section and serves as a shield when overlying said forearm of a user.

3,974,821

CHARCOAL FIRE STARTER AND COOKER

Duane L. Storandt, 12 Hanley Downs, St. Louis, Mo. 63117

Continuation-in-part of Ser. No. 340,257, March 12, 1973, Pat. No. 3,848,577. This application Nov. 8, 1974, Ser. No. 523,042
Int. Cl.² A47J 37/07; F24B 3/00
U.S. Cl. 126—25 B **3 Claims**

1. In a charcoal fire starter having a body with open ends, said body having vents adjacent said open ends; a grate carried by said body and dividing same into a fuel chamber and a fuel ignition chamber; and body handle means for manipulating said body; the improvement comprising:

closure means receivable over at least one open end of said body;

handle means carried by said closure means;

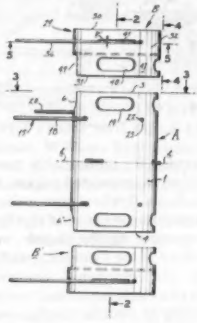
said closure means comprising:

a closure body having a first edge and a second edge;

a panel connecting said first and second edges;

a plate carried by said closure body dividing same into first and second compartments;

one of said compartments receiving an open end of said body;



means defining diametrically opposed elongate arcuate slots in said panel and a locking aperture presented spacedly from each slot;

said handle means of said closure means comprising:

a web;

a pair of elongate legs received within said arcuate slots; and

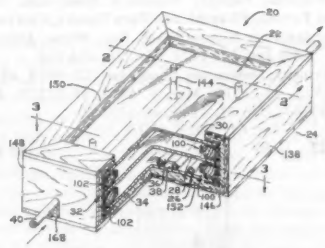
a pair of lugs bent inwardly of said elongate legs and adapted for reception within the related locking apertures.

3,974,822

SOLAR HEAT COLLECTOR

Pandit G. Patil, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 13, 1974, Ser. No. 450,703
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **9 Claims**



1. A solar heat collector, comprising:

at least one cover plate capable of passing solar energy having a major surface with a predetermined transmittance coefficient greater than zero, said at least one cover plate having predetermined peripheral dimensions and shape;

a solar energy absorber having peripheral dimensions and shape similar to said at least one cover plate, said absorber having conduit means for moving a heat absorbing medium therethrough and a major surface having a predetermined absorptivity greater than zero;

a rigid spacer frame having peripheral dimensions and

shape similar to said at least one cover plate, said spacer frame mounting marginal edge portions of the major surfaces of said at least one cover plate and said absorber to provide a compartment therebetween;

desiccating means mounted in said spacer frame and communicating with the compartment to remove moisture in the compartment;

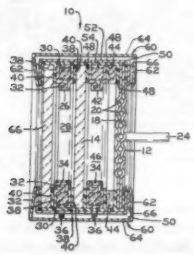
a continuous layer of moisture-impervious adhesive mounting said at least one cover plate, absorber and spacer frame to prevent moisture from moving into the compartment; and

said layer of moisture-impervious adhesive and desiccating means maintaining the compartment essentially free of moisture to prevent the decrease of the predetermined absorptivity coefficient of said absorber and predetermined transmittance coefficient of said at least one cover plate.

3,974,823
SOLAR COLLECTOR HAVING MINIMUM EDGE HEAT LOSS

Pandit G. Patil, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 18, 1975, Ser. No. 550,681
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **10 Claims**



1. In a solar heat collector of the type having at least one cover plate for passing solar radiation; a solar energy absorber plate; a metal spacer frame between the marginal edge portions of the cover plate and the absorber plate to maintain the cover plate and absorber plate in spaced relation to provide an airspace therebetween; and means for maintaining the cover plate and the absorber plate about the spacer frame, the improvement comprising:

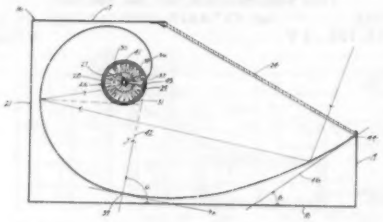
a thermal-insulating material between the marginal edge portions of the absorber plate and the spacer frame to reduce conduction heat losses of the collector.

3,974,824
SOLAR HEATING DEVICE

Ronald H. Smith, San Francisco, Calif., assignor to Solergy, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 496,192, Aug. 9, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,268
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **26 Claims**

1. In a solar heating device, an absorber having means defining an axially extending flow passageway for carrying fluid to be heated and a cylindrical reflector for concentrating solar energy on the absorber to heat the fluid in the passageway, said reflector being disposed along a path extending spirally from a first point proximate to the outer periphery of the absorber to a second point spaced a predetermined distance from the absorber and parabolically from the second point to a third point spaced from the absorber by a distance

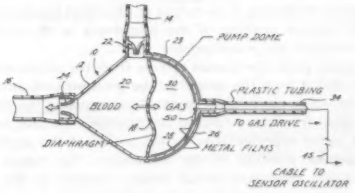


greater than the predetermined distance, whereby solar energy impinging upon the reflector is reflected inwardly and ultimately strikes the absorber.

3,974,825
REMOTE ELECTRICAL MONITORING OF GAS ACTIVATED BLOOD PUMPS

Nils A. Normann, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Filed Oct. 1, 1975, Ser. No. 618,718
Int. Cl.² A61F *1/24*
U.S. Cl. 128—1 D **8 Claims**



8. In a blood pump having a flexible member actuated by gas through a conduit for pumping blood through the pump in which the internal electrical capacitance in the pump, one plate of which is formed by an electrically conducting film and the other plate of which is formed by the blood flexible member and gas, varies in accordance with the position of the flexible member, the improvement in an electrical capacitance measuring system using a Clapp type oscillator having a tank circuit separate from the oscillator proper for measuring the instantaneous position of the flexible member comprising,

said internal electrical capacitance in the pump forming a portion of the tank circuit, and frequency modulating the oscillator,

an electrically protective shield on the outside of the pump, and the electrical capacitance formed between the electrically conducting film on the inside of the pump and the electrically protective shield being functionally connected in parallel to the internal electrical capacitance,

an inductor connected in series with the internal electrical capacitance and the electrical capacitance formed between the film and the shield,

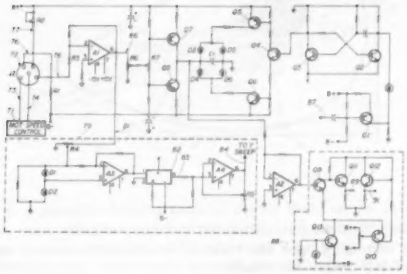
a cable having an electrically conducting cover and an inside wire connected between the inductor and the oscillator, the cover of the oscillator end of the cable being connected directly to ground, and the cover of the pump end of the cable being connected to the electrically protective shield.

3,974,826

DISPLAY CIRCUITRY FOR ULTRASONIC IMAGING

Reginald C. Eggleton, and Kenneth W. Johnston, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Inc. non-profit, Indianapolis, Ind.

Filed Sept. 16, 1974, Ser. No. 506,564
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V 6 Claims



3. In a B-mode real-time ultrasonic scan and display apparatus including an ultrasonic probe, means for producing ultrasonic pulses and receiving echoes of said pulses through said probe including a transducer in the probe, means for sweeping the transducer through a range of angular positions at a real time rate, an oscilloscope display for real-time B-mode presentation of the received echoes, sweep circuit means including a Y-axis sweep generator circuit producing a sawtooth deflection waveform, for providing horizontal and vertical deflection for the oscilloscope, position indicator means in the probe for producing at an output an electrical signal indicative of the angular position of the transducer in the probe, the improvement which comprises:

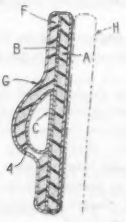
a cosine generator circuit remote from the ultrasonic probe coupled from the output of the position indicator means including conversion means for converting the electrical signal from the output of the position indicator means to a signal representative of the cosine of the angle of the angular position of the transducer, the output of the cosine generator circuit being coupled to the Y axis sweep generator circuit to modulate the slope of the Y sweep generator sawtooth.

3,974,827

PORTABLE ORTHOPEDIC DEVICE

Joseph J. Bodeen, Morgan Hill, Calif., assignor to Benjamin T. Angileri, San Jose, Calif.

Filed May 12, 1975, Ser. No. 576,698
Int. Cl.[2] A61F *5/00*; A47C *27/08*, *27/18*
U.S. Cl. 128—70 4 Claims



1. A portable orthopedic device comprising:

a. a flat back support made of semi-flexible material;

b. an air inflatable bladder secured to the front surface of said back support and extending over only a portion of the front surface thereof;

c. a front layer of a flexible compressible material covering the same area as said back support and overlying the bladder and exposed area of said support, said front layer having an integral flap overlying said bladder and being coextensive with the front surface of said bladder so that the flap will swing outwardly and permit the bladder to be inflated;

d. a cover enclosing the back support, bladder and said front layer; and

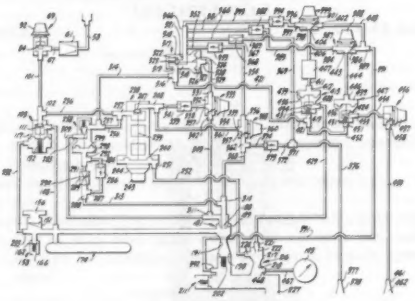
e. hand actuated means for pumping the desired amount of air into said bladder for inflating it to the desired extent so that the device can be placed to apply the desired yieldable pressure against the lumbar region of a person when in a sitting position or can be placed at the cervical or lumbar region to apply the desired yielding pressure when a person is in a supine position.

3,974,828

VENTILATOR AND METHOD

Forrest M. Bird, 212 NW. Cerritos, Palm Springs, Calif. 92262

Filed Jan. 27, 1975, Ser. No. 544,505
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 20 Claims



1. In a ventilator having an inhalation phase and an exhalation phase in its operative cycle, an inlet adapted to be connected to a source of gas under pressure, first and second outlets, a servo controller having an inlet means for connecting said servo controller inlet to said ventilator inlet, said controller also having an outlet, control valve means disposed in said servo controller and movable between open and closed positions to control the flow of gas from the inlet to the outlet of the servo controller, said control valve means being in open or on position during the inhalation phase of the ventilator and in a closed or off position during the exhalation phase of the ventilator, a patient adapter, means for connecting the outlet of the servo controller to said first outlet of the ventilator, means for supplying gas from the first outlet to the patient adapter, an exhalation valve means movable between open and closed positions and in the open position permitting gases to flow from the patient adapter to the atmosphere and in the closed position preventing the flow of gases from the patient adapter to the atmosphere, means for supplying gas from the inlet of the ventilator to the second outlet of the ventilator, means for supplying gas from the second outlet of the ventilator to the exhalation valve assembly to maintain the exhalation valve assembly in a closed position, means for sensing the pressure of the gas in the means for supplying gas from the outlet of the servo controller to the patient adapter and for switching the servo controller from an open position to a closed position when a predetermined pressure is reached and flow accelerator means connected to said inlet of the ventilator and to said first outlet of the ventilator for augmenting the flow of inspiratory gases through the first outlet, said flow accelerator means having valve means movable between open and closed positions for controlling the flow of fluid from said source to said first outlet, said flow accelerator means having means yieldably urging said valve means of said flow accelera-

tor means towards a closed position, said flow accelerator means having diaphragm means coupled to said valve means of said flow accelerator means, flow passage means establishing communication between said diaphragm means and said first outlet, adjustable means in said flow passage message for adjusting the rate of flow of gases from the first outlet to the diaphragm means for controlling the time when the valve means of the flow accelerator cartridge is moved to an open position to augment the flow of inspiratory gases and check valve means connected in parallel across said adjustable means for dumping gases from behind said diaphragm means to terminate any augmented flow of inspiratory gases through the flow accelerator means when the control valve means of the servo controller moves to a closed position.

3,974,829

MEANS FOR PREVENTING FOGGING OF OPTICAL AIDS USED BY THE WEARER OF A SURGICAL MASK

George W. Tate, Jr., Dallas, Tex., assignor to Giles C. Clegg, Jr. and John R. Lynn, both of Dallas, Tex., part interest to each

Filed July 8, 1974, Ser. No. 486,594
Int. Cl.² A61M *16/00*
U.S. Cl. 128—146.2 **11 Claims**

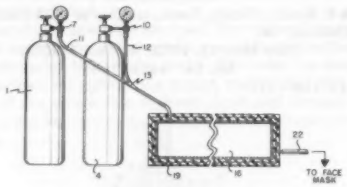
1. An improved surgical face mask comprising:
a rectangular body which is relatively impervious to bacteria yet porous enough for facilitating exhausting of the wearer's breath and having an upper edge, an upper portion and a lower portion;
an elongated cushioning element attached to a surface of said body adjacent the upper edge of the mask;
a sheet of air impervious material covering substantially the entire upper portion of the mask and affixed thereto to prevent the wearer's breath exhausted through said body reaching the vicinity of the wearer's eyes are fogging optical aids used by the wearer; means for securing the mask over the mouth and nose of the wearer; and
an elongated, malleable strip attached to and extending substantially across the upper portion adjacent the upper edge of the mask, said strip being of a material having sufficient retentivity to retain its shape upon deformation and compress said cushioning element against the nose and cheekbones of the wearer for providing a seal between the upper edge of the mask and the wearers face;
said elongated cushioning element extending substantially across the upper portion adjacent the upper edge of the mask and contoured and including a central portion of reduced thickness adapted to be positioned over the bridge of the nose when the mask is worn and which is bounded by a pair of portions of maximum thickness which taper in directions away from said central portion toward portions of reduced thickness at the opposite edges of said cushioning element, said portions of maximum thickness being sufficiently thick to provide a seal in the vicinity of the wearers nose when compressed by the malleable strip and sufficiently tapered for the remainder to be in sealing contact with the wearer's face but not to interfere with the downward vision of the wearer.

3,974,830

METHOD AND APPARATUS FOR CARBON DIOXIDE THERAPY (CDT) OF ADDICTONS

Albert A. LaVerne, 17 E. 82nd St., New York, N.Y. 10028

Filed Jan. 27, 1975, Ser. No. 544,320
Int. Cl.² A61M *16/00*
U.S. Cl. 128—212 **13 Claims**



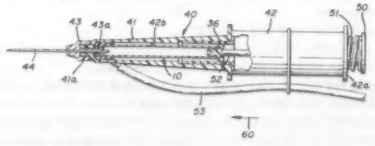
1. A method of treating addictions in human patients by carbon dioxide therapy comprising the steps of:
providing a mixture of carbon dioxide and oxygen gases in which the major portion of the gas mixture is carbon dioxide,
heating the gas mixture, and
administering the heated gas mixture for breathing by the patient in an amount sufficient to reduce the state of consciousness in the patient to a state less than a full coma.

3,974,831

CARTRIDGE AND SEALING MEANS THEREFOR

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Filed Sept. 26, 1974, Ser. No. 509,424
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 D **4 Claims**



1. In combination with a hypodermic syringe of the type having an elongate hollow body with a double-ended needle disposed on one end, a movable plunger on the opposed end and aspirating means disposed adjacent the end carrying the needle, the improvement comprising;
A. a cartridge having
1. an elongate hollow body with a substantially uniform diameter throughout its length and having
a. opposed first and second ends and
b. being receivable within said body of said syringe, with said first end of said cartridge body being disposed adjacent said needle and said aspirating means and said second end being disposed adjacent said plunger;
B. a first unitary resilient seal member
1. received on said first end of said cartridge body in sealing relationship thereto and
2. engaging the inner surface of said syringe body in sealing relationship therewith;
C. a second unitary resilient seal member
1. received on said second end of said cartridge body in sealing relationship thereto and
2. engaging the inner surface of said cartridge body in sealing relationship therewith;
D. said second seal member having
1. a main body portion receivable within said second end of said cartridge body; and

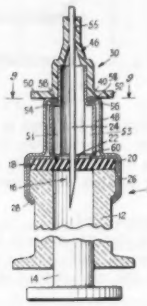
2. an annular flange on one end thereof normally adapted to engage and overlie the second end of said cartridge body and simultaneously engage the inner surface of said syringe body.

3,974,832

INTERCHANGEABLE HYPODERMIC NEEDLE ASSEMBLAGE

Ralph E. Kruck, Clinton, Conn., assignor to VCA Corporation, Richmond, Va.

Filed Mar. 22, 1973, Ser. No. 343,796
Int. Cl.² A61M 5/00
U.S. Cl. 128—221 **2 Claims**



1. In a syringe, an interchangeable needle assemblage comprising in combination:

a. a syringe body having a discharge opening at one end,

b. a frangible membrane extending across the discharge opening and adapted to be pierced in order to provide access to the syringe body,

c. a ferrule secured to the syringe body at the discharge opening,

d. a double pointed needle,

e. a needle hub fixedly and permanently secured to the needle at a point intermediate its ends,

f. said ferrule having a key slot adapted to receive a portion of said hub and said needle, and

g. cooperable shoulder means on said hub and on said ferrule at the key slot thereof, for releasably holding the hub in a deep position in the ferrule in response to insertion of the hub and needle into the key slot and turning of the hub therein,

h. one end of the needle piercing the said membrane and communicating with the interior of the syringe body in response to said insertion,

i. said hub comprising a hollow key member extending around a portion of the needle,

j. said key member being elongate and having an external projection constituting the shoulder means thereof, adapted to underlie and abut the shoulder means on the ferrule,

k. one portion of the shoulder means of the ferrule having an inclined configuration for camming the projection of the hub inwardly of the ferrule.

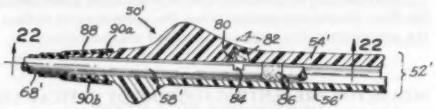
3,974,833

DISPOSABLE ELECTROSURGICAL CAUTERY HAVING OPTIONAL SUCTION CONTROL FEATURE

John G. Durden, III, Auburn, Ga.

Continuation-in-part of Ser. No. 342,382, March 19, 1973, Pat. No. 3,825,004. This application July 22, 1974, Ser. No. 490,243
Int. Cl.² A61B 17/36; A61N 3/04; A61M 1/00
U.S. Cl. 128—275.1 **38 Claims**

27. In a hand-operated electrosurgical cautery instrument embodying a combination cauterizer electrode and sucker tube, the instrument being adapted for use with remotely located vacuum source means and electrical high frequency current source and control means, handle means having electrical and thermal insulating characteristics fully embracing and in sealed relationship with at least an intermediate portion of said combination electrode and sucker tube and terminating short of and freely exposing a substantial distal portion of said electrode/sucker tube, a flexible electrical conductor wire of predetermined length having one end electrically connected to a portion of said electrode tube which is embraced by the handle means, the wire extending from a generally proximal portion and being insulated exteriorly of said handle means for connection with said electrical power source; the improvement comprising in combination therewith:



a. a suction control hole provided in said electrode/sucker tube in an area within the sealed portion of said handle means;

b. suction control cavity means formed internally in said handle means generally adjacent said suction control hole in said electrode/sucker tube; and

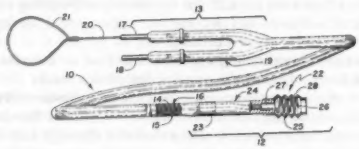
c. said handle means including a frangible layer overlying its said suction control cavity means and constituting a unitarily formed membrane cover thereof which is adapted to be selectively removed to establish a suction control feature with said instrument or may be left undisturbed and in place as desired by the user.

3,974,834

BODY-IMPLANTABLE LEAD

Lawrence M. Kane, Rosenville, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 23, 1975, Ser. No. 570,917
Int. Cl.² A61N 1/04
U.S. Cl. 128—418 **10 Claims**



1. A body-implantable, intravascular lead adapted to be connected at its proximal end to a source of electrical energy and permanently secured at its distal end through the endothelial tissue of a living animal body for electrical stimulation thereof and for detecting electrical signals comprising:

electrically conductive lead means for insertion in and guidance through a body vessel to a desired location and position inside an organ of a living animal body, the lead means having a cross-section which will fit within a body vessel;

electrode means affixed to the distal end of said lead means and adapted to supply electrical impulses to tissue at a desired location inside the living animal body, said electrode means including a tissue piercing portion and further including separate tissue engaging means for allowing said electrode means to be firmly and permanently secured through the endothelial tissue at the desired location;

material means substantially inert to body fluids and tissue encasing said lead means and a portion of said electrode means for sealing them from living animal body fluids and tissue; and

sleeve means attached to said distal end of said lead means for shrouding said tissue piercing portion and said tissue

engaging means thereby allowing the insertion and guidance through a body vessel of said lead means while preventing injury to said body vessel by said tissue piercing portion and for retracting upon contact with endothelial tissue from said tissue piercing portion and said tissue engaging means for allowing said electrode means to be firmly lodged in and secured through the endothelial tissue.

3,974,835

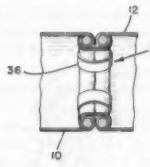
ANASTOMOTIC APPARATUS AND METHOD

Thomas G. Hardy, Jr., 350 E. Broad St., Columbus, Ohio 43215

This application Dec. 26, 1974, Ser. No. 536,325

Int. Cl.² A61B *17/11*

U.S. Cl. 128—334 C **3 Claims**



1. Apparatus for intestinal anastomosis comprising: a pair of separate anastomotic ring members for securement each to the free end of the two tubular tissue members to be anastomosed, each having interior and exterior surfaces; and a separate annula coupling time for securing each ring member and attached tissue member to the other ring member and attached tissue member, the tissue member ends being contiguously inverted to enable the ends to grow together permanently and approximate the outer surface of the intestine, and each of said ring members having a pluraity of fenestrated projections and further comprising means connecting said ring member projections to the tissue member ends, said coupling tube having a convex outer surface, a concave inner surface, and an opening substantially defined by said convex outer surface, said coupling tube concave surface engaging each of said ring members proximate said fenestrated projection, said coupling tube wall carrying a plurality of elongated openings therein.

3,974,836

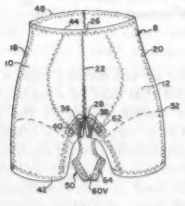
GIRDLE

Aileen S. Carlson, 8536 Mansfield, Morton Grove, Ill. 60053

Filed Apr. 14, 1975, Ser. No. 567,700

Int. Cl.² A41C *1/00*

U.S. Cl. 128—526 **5 Claims**



1. A girdle comprising:

a trunk of two-way stretch material having side seams and defining a waist opening and a lower portion defining leg openings; said trunk defining an elongated crotch opening disposed between the leg openings;

a two-way stretch panel for closing said crotch opening having a back portion attached at one end to the rear part of the trunk at the waist level thereof and a substantial distance along the side seams thereof above the level of the crotch opening, said panel narrowing therebelow to a crotch flap having a free end clearing the crotch opening when unstretched; and

fastening means provided upon said free end and upon the trunk at approximately the pubic crest of a wearer thereof for releasably holding the crotch flap under the tension established throughout the stretch panel when the free end of the crotch flap is drawn down and forward between the leg receiving openings and is fastened to the trunk.

3,974,837

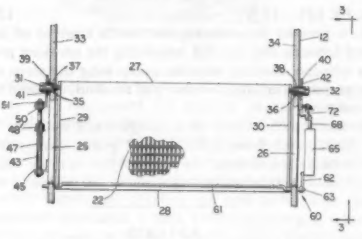
CROP COMBINE WITH A RESILIENTLY MOUNTED CROP SEPARATOR

Paul A. Applegate, R.R. 4, Box 323, Brookville, Ind. 47012

Filed Mar. 3, 1975, Ser. No. 554,735

Int. Cl.² A01F *12/28*

U.S. Cl. 130—27 S **3 Claims**



1. In a combine including a main frame, power means mounted on said main frame operable to propel said combine, gathering means mounted on said frame operable to gather crops from land, conveying means mounted on said frame and positioned adjacent said gathering means operable to convey said crop from said gathering means, a separator including a cylinder rotatably mounted on said frame adjacent said conveying means, said separator further including means operable to rotate said cylinder, said separator further including a concave frame mounted on said main frame and extending at least partially around said cylinder being spaced apart a first distance from said cylinder to receive said crop therebetween from said conveying means,

mounting means connected to said concave frame and resiliently connected to said main frame being operable to allow said concave frame to resiliently move to and from said cylinder, said concave frame moves away from said cylinder as a foreign object having a thickness greater than said first distance moves between said cylinder and said concave frame; wherein the improvement comprises:

said concave frame includes a rear edge portion and a front edge portion, said mounting means includes first means resiliently connected to said main frame and connected to said rear edge portion of said concave frame operable to allow said rear edge portion of said concave frame to resiliently move to and from said cylinder;

said mounting means includes second means resiliently connected to said main frame and connected to said front edge portion of said concave frame operable to allow said front edge portion of said main frame to resiliently move to and from said cylinder;

said combine includes a control arm connected to said second means to allow manual movement of said front end portion of said concave frame;

said second means includes a crank arm mounted to said main frame and connected to said front edge portion of said concave frame, said second means includes a threaded rod connected to said control arm, said second means further includes a coiled spring through which said threaded rod extends, said spring extending between and urging apart said crank arm and said control arm, said second means further includes an offset rod with a main rod portion mounted to said front edge portion of said concave frame, said offset rod has opposite ends offset from said main rod portion with said ends pivotally mounted on said main frame with one of said ends connected to said crank arm providing eccentric movement of said main rod portion and said front edge portion as said crank arm pivots.

3,974,838

SMOKING MATERIALS

Terence G. Mitchell, Romsey, and John A. Pritchard, Southampton, both of England, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 366,748, June 4, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,459

Int. Cl.² A24B *3/12*

U.S. Cl. 131—17 R **13 Claims**

1. A process for reducing the starch content of dried uncured tobacco and thereby improving the smoking properties of a tobacco smoking material comprising the steps of:

a. preparing an aqueous slurry of crushed, uncured tobacco; and

b. treating the slurry at a temperature between 20° and 90°C. with from 0.001 to 0.2 grams per gram of dry tobacco of at least one amylolytic enzyme capable of converting the starch contained in the tobacco into sugar.

3,974,839

CONDITIONING OF TOBACCO

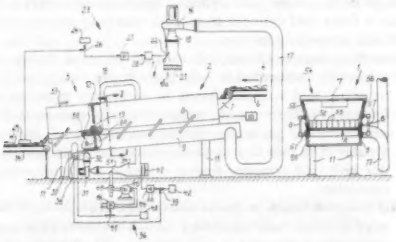
Waldemar Wochnowski; Uwe Leckband; Hans-Heinrich Barth, all of Hamburg, and Reinhard Hohm, Hamburg-Bahrenfeld, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 297,868, Oct. 18, 1972, Pat. No. 3,877,469. This application Nov. 18, 1974, Ser. No. 524,929

Claims priority, application Germany, Oct. 19, 1971, 2151844; Mar. 11, 1972, 2211879

Int. Cl.² A24B *3/06*

U.S. Cl. 131—136 **9 Claims**



1. A method of conditioning tobacco, comprising the steps of transporting a continuous stream of tobacco particles in a predetermined direction along a predetermined support path; passing across said path ascending currents of a gaseous fluid whereby the particles of tobacco exchange energy with said gaseous fluid and at least some particles of the stream float in the fluid which crosses said path; vibrating the particles of said stream and pulsating said currents, at least during crossing of said path, to thereby promote the exchange of energy between tobacco and the fluid and to effect a loosening of the constituents of said stream; and reducing the speed of ascending currents in the course of energy exchange with the particles of said stream to thereby prevent the ascending fluid from entraining appreciable quantities of tobacco particles above and away from said path.

3,974,840

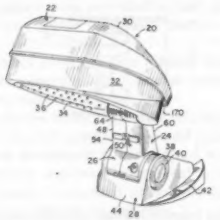
PORTABLE HOODED HAIR MOISTURIZER AND DRYER

Edward J. Doyle, Hatboro, and Nial C. Bartram, Lancaster, both of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Continuation of Ser. No. 299,839, Oct. 24, 1972. This application Nov. 11, 1974, Ser. No. 522,449

Int. Cl.² A45D *1/00*

U.S. Cl. 132—9 **10 Claims**



1. A portable combination hair moisturizer and dryer comprising: a base, a rigid head assembly including an air distribution plenum having means for directing air generally radially inwardly with respect to said head assembly; means comprising a rigid head-mounting assembly including a housing pivotally adjustably secured at respective opposite ends thereof to said base and to said head assembly for supporting said head assembly above said base; means for impelling and heating air; means for directing heated air through said head mounting assembly to said plenum; and steam-generating means including a liquid reservoir mounted in the interior of said housing for directing steam to said plenum.

3,974,841

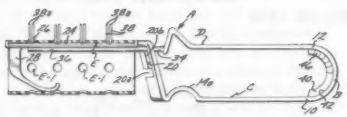
COMBINED COMB AND HAIR ROLLER SUPPORT

Harry Daniel Weisman, 9372 Portsmount Drive, Huntington Beach, Calif. 92646

Filed Aug. 22, 1975, Ser. No. 606,753

Int. Cl.² A45D *2/00*

U.S. Cl. 132—40 **6 Claims**



1. A one-piece device formed from a rigid but deformable polymerized resin that may be selectively used as a comb on a woman's hair during drying of the latter in a stream of warmed air, or as a support for a cylindrical shell that has a plurality of longitudinally spaced openings formed therein and about which shell said air may be wound at a desired stage in the drying of the hair, said device comprising:

a. an elongate body of said resin that includes an arcuate intermediate section which has first and second ends, and from which first and second ends, first and second elongate sections project; said first section including a first handle portion adjacent said first end, said first handle

portion having a first extremity; a leg that extends outwardly at an angle from said first extremity, said leg having an elongate slot formed therein, and said leg having a first outer end;

b. a first elongate member that extends outwardly from said first outer end, said first member having a plurality of longitudinally spaced apertures formed therein that are on the same spacing as said openings;

c. an angularly disposed tang supported from the free end of said first member; said second section including a second handle portion adjacent said second end, said second handle portion having a first extremity;

d. a rod that projects from said first extremity of said second handle portion;

e. a second elongate member supported by said rod;

f. a plurality of teeth that project outwardly from said second member and are on the same longitudinal spacing as said apertures and extend outwardly therethrough when said body is deformed to dispose said rod in said slot with said first and Second portions being substantially parallel to one another and said first member overlies said second member, with said device when so disposed adapted to be used as a comb, and said device being adapted to be used to removably support said shell when the latter is gripped between said first and second members with said teeth extending through said openings therein and said tang pressure-contacting the interior surface of said shell to assist in holding said shell in a fixed position on said device.

3,974,842

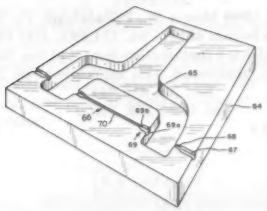
DISPOSABLE FLOSSER

Ingran S. Chodorow, Hartsdale, N.Y., assignor to Placontrol Inc., Briarcliff Manor, N.Y.

Continuation-in-part of Ser. No. 267,219, June 28, 1972, abandoned. This application Dec. 28, 1973, Ser. No. 429,654

Int. Cl.² A61C *15/00*

U.S. Cl. 132—91 **10 Claims**



1. A method of making from fluid plastic a solid flosser having a handle part and extending therefrom two arms spaced apart with a strand of floss having a central part spanning the space between said arms and having end-parts embedded within said arms, the method comprising forming a mold and cavity therein defining handle and arm parts corresponding closely to said handle and arm parts of said flosser, positioning the central part of a strand of floss to span the space between said arms of the cavity and said end parts to traverse said arms of the cavity prior to flowing fluid plastic therein, flowing fluid plastic into said cavity by injection molding process, and thereby embedding with plastic said end parts of the strand in said arm parts of the cavity, and thus coating with said plastic substantially the entire outer peripheral surface of said end-parts, hardening said fluid plastic and thereby in substantially a single step forming said solid flosser and securing said floss end-parts in and integrally with the flosser's arm parts.

3,974,843

WASHING MACHINE MORE ESPECIALLY FOR DENTAL INSTRUMENTS AND EQUIPMENT FOR MAKING DENTAL PROSTHESES

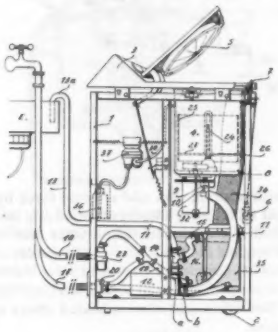
Michel Aubert, Geneva, Switzerland, assignor to Societe Distrembal SA, Paris, France

Filed July 25, 1975, Ser. No. 599,162

Claims priority, application France, June 23, 1975, 75.19530

Int. Cl.² B08B *3/04*

U.S. Cl. 134—95 **21 Claims**



1. Washing machine for instruments, in particular dental instruments and equipment for making dental prostheses, characterised by the fact that it comprises a frame containing all the units of the machine, a tank fixed in the upper part of this machine and open at the top, a lid enabling the tank to be closed, at least one feed pipe intended to be connected to a running water supply and enabling the tank to be filled via a water treatment apparatus, a tank emptying pump, a removably mounted cylinder in the tank which rotates about a vertical axis, at least one support member for receiving articles to be washed and arranged so that it can be removably fixed in the cylinder, and also at least one motor situated on the outside of the tank which drives, through the wall of this tank, a propeller situated in the tank under the said supports and eccentric with respect to the cylinder, wherein this propeller produces on the one hand a gyratory circulation of the liquid in the tank which causes the cylinder to rotate, and on the other hand liquid pulsations and vibrations in all directions in order to create a strong localised turbulence in the tank which efficiently washes articles placed in the supports.

3,974,844

VALVE

Daniel R. Pimentel, Seekonk, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

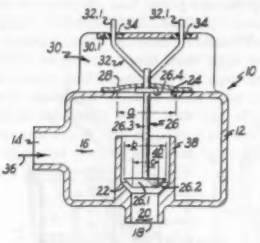
Division of Ser. No. 368,923, June 11, 1973, Pat. No. 3,845,931. This application Aug. 26, 1974, Ser. No. 500,215

Int. Cl.² F16K *31/02*; **F03G** *7/06*

U.S. Cl. 137—1 **8 Claims**

1. A valve device comprising body means having an inlet passage and an outlet passage and having valve seat means between said passages arranged to permit fluid flow through said body from said inlet passage through said outlet passage, valve member means mounted on said body means to be freely movable between an open valve position spaced from said valve seat means and a closed valve position engaging said valve seat means in the absence of said fluid flow, said valve member means having at least a first portion thereof disposed in at least one of said passages in a position tending to oppose said fluid flow, said first position of the valve member means being proportioned so that, when a selected level of fluid flow is introduced in said one passage, said valve member means is

urged to said closed valve position with selected force in response to said fluid flow and is otherwise substantially free of other forces urging said valve member means to closed valve position, and actuator means of a selected metal alloy secured between said valve member means and said body means to be deformed from an original configuration to a second configuration as said valve member means is moved to



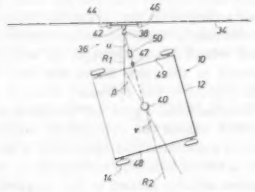
said closed valve position with said selected force by said fluid flow while said metal alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to said original configuration and to display a relatively higher modulus of elasticity to move said valve member means to said open valve position against said selected force caused by said fluid flow when said alloy is heated above said transition temperature.

3,974,845

SELF-CORRECTING LINEARLY MOVABLE IRRIGATION SYSTEM

Harald Indresaeter, Lubbock, Tex., assignor to Gifford-Hill & Company, Inc., Lubbock, Tex.

Filed Sept. 22, 1975, Ser. No. 615,209
Int. Cl.² B05B *3/18*; E01H *3/02*
U.S. Cl. 137—1 **20 Claims**



1. A method of irrigating a land area having an elongated reference through the use of an elongated irrigation system having reference sensing means, said method comprising:

locating one extremity of the irrigation system in close proximity of said elongated reference and placing said reference sensing means in sensing relationship with said elongated reference;

placing said elongated irrigation system in communication with said supply of water;

energizing said irrigation system to cause movement of the said irrigation system on said land area with each extremity of said irrigation system moving at substantially the same speed;

detecting any linear displacement and angular misalignment of said irrigation system relative to said reference;

correcting linear displacement and angular misalignment that is beyond acceptable limits by alternate end movement causing one of the extremities of said irrigation system to move at a rate differing from the rate of movement of the opposite extremity of said irrigation system and then causing the other extremity of said irrigation to move at a rate differing from the rate of movement of said one extremity, causing the irrigation system to perform a turning movement that is designed to steer said reference sensing means toward a predetermined relationship with said elongated reference; and

causing both of the extremities of said irrigation system to resume movement at substantially the same rate of movement until such time as movement of said irrigation system is such as to move said reference sensing means out of said predetermined relationship with said elongated reference.

12. Apparatus for irrigating land areas, said apparatus comprising:

an elongated water supply being located on said land area;

an elongated reference being located on said land area;

an elongated irrigation system adapted for substantially continuous movement in generally lateral manner over said land area said lateral movement being executed by movement of each extremity of said irrigation at substantially the same speed;

means communicating said irrigation system with said elongated water supply and supplying water under pressure to said irrigation system;

sensing means being connected to said irrigation system and being capable of measuring linear displacement and angular misalignment of said irrigation system relative to said elongated reference; and

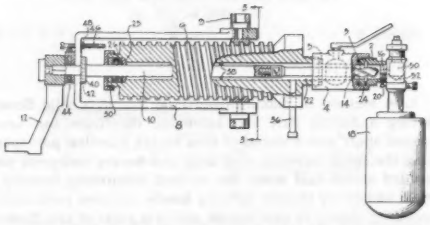
control means being provided for said irrigation system and receiving linear displacement and angular misalignment signals from said sensing means, said control means, responsive to said signals causing changes in the relative speed of movement of each extremity of said irrigation system when the position of said irrigation system relative to said elongated reference is detected by said sensing means to be beyond acceptable limits, causing said irrigation system to automatically execute a steering movement that brings its direction of movement toward a predetermined relationship with said elongated reference.

3,974,846

APPARATUS AND METHOD FOR GAINING ACCESS TO THE CONTENTS OF PRESSURIZED VESSELS AND SYSTEMS

Samuel Serota, 1809 Mower St., Philadelphia, Pa. 19152

Continuation-in-part of Ser. No. 271,893, July 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 75,399, Sept. 25, 1970, abandoned. This application Feb. 25, 1974, Ser. No. 445,741
Int. Cl.² F16K *51/00*
U.S. Cl. 137—15 **13 Claims**



1. An apparatus for gaining access to the fluid contents of vessels and systems in which the contents are under pressures ranging in excess of 10,000 pounds per square inch and for discharging and recovering the fluid contents safely under controlled conditions without damaging the vessels and systems, comprising:

a. a first member for regulating the flow of fluid released from the vessel;

b. a second member connected to and in axial alignment with said first member for holding and containing the

aforesaid fluid, said first and second members having a coaxial fluid conveying means;

c. a rotatable member mounted for longitudinal movement with the aforesaid fluid conveying means of said first and second members, said rotatable member being provided with fluid conducting and pressure equalizing means for equalizing the pressure on both ends of said member;

d. a cutting means detachably connected to the forward end of the rotatable member;

e. adapter means to connect the apparatus to the vessel;

f. handle for rotating the rotatable member; and

g. sealing means to prevent leakage of fluid from the apparatus, said means being provided by O-rings, and O-ring assemblies to allow for high pressures and to forestall hydrogen embrittlement and catastrophic failure of the apparatus.

10. A method of gaining access to and safely recovering the contents of a vessel containing compressed fluids when a valve, which has a stem and a seat and is an integral part of said vessel and which is the only means provided to safely and controllably communicate with the compressed fluids, has been rendered inoperable and non-functioning, comprising the steps of:

a. attaching to the valve of said vessel an apparatus that can safely be used to gain access to and controllably recover from the vessel compressed fluids under pressures up to at least 10,000 pounds per square inch, said apparatus comprising, a pressure tube assembly and ball valve having a coaxial conduit, a rotatable shaft and drill bit mounted for longitudinal movement within the conduit, said shaft having a fluid conducting and pressure equalizing means for equalizing the pressure on both ends of the shaft, means connected to the shaft for rotating the shaft and drill bit, and adapter means for connecting the apparatus to the valve of the vessel, said apparatus having O-ring and O-ring assembly sealing means to seal pressure tight the parts to each other and the apparatus to the vessel valve and said apparatus having internal surfaces that are free of notches and angles;

b. rotating the shaft and drill bit of the apparatus until communication is made with the contents of the pressurized vessel;

c. retracting the rotatable shaft and drill bit;

d. closing the ball valve;

e. detaching the pressure tube assembly from the ball valve; and

f. connecting to the ball valve a take-off means for the safe and controlled disposal of the contents of the pressurized vessel, said method being completed without damaging the vessel.

3,974,847

LIQUID ADDITIVE DISPENSER

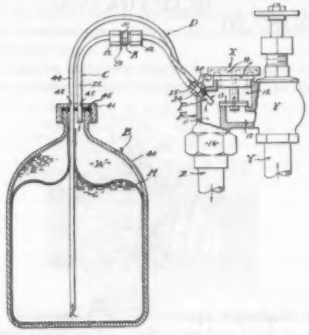
Kenneth M. Hodges, 12331 Washington Blvd., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 169,275, Aug. 5, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,005

Int. Cl.² G05D *11/02*

U.S. Cl. 137—101.11 **2 Claims**

1. A liquid proportioning dispenser for precisely fixing the flow rate of an additive charged liquid of variable viscosity into the flow line of a carrier liquid having substantially uniform viscosity and including; a closed vessel storing the first mentioned liquid, a positive pressure port exposed into a high upstream pressure of the first mentioned flow line, a negative pressure port exposed into a low downstream pressure of the first mentioned flow line, a tubular liquid pressure displacement connection from the positive pressure port and into the closed vessel, and a tubular liquid pressure delivery connection into the negative pressure port and opening from the additive charged liquid stored in the closed vessel, there being a flow restrictor in the form of a pourous body pressed into the body of a coupling joining sections of the tubular liquid pressure displacement connection which oppose and position the said porous body plugging the said positive pressure port and connection therefrom into said closed vessel, whereby the differential between upstream and downstream pressures



determines the flow rate of upstream carrier liquid of substantially uniform viscosity through said flow restrictor and displaces stored additive charged liquid to be subsequently dispensed into the downstream liquid at a substantially uniform slow flow rate.

3,974,848

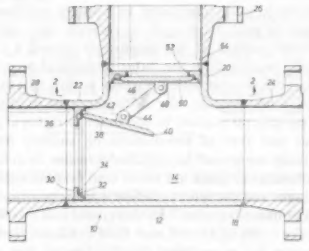
THREE PORT TWO WAY CHECK VALVE

Thomas Wheatley, 3717 Pinemont, Houston, Tex. 77018

Filed May 16, 1975, Ser. No. 578,257

Int. Cl.² F16K *15/03*

U.S. Cl. 137—102 **4 Claims**



1. A three-port, two-way check valve, comprising:

a tee body having three ports in planes located at right angles with respect to one another;

a transverse valve seat in the center port of the three ports;

a valve element in said valve seat;

a hinge transversely positioned adjacent to said valve seat for pivotally mounting said valve element for opening and closing relative to said valve seat;

a second transverse valve seat in one of the two remaining ports;

a second valve element in said second valve seat;

a second hinge positioned adjacent to said second valve seat for pivotally mounting said second valve element for opening and closing relative to said valve seat;

said first and second hinges being parallel to one another and also being located on the side of their respective ports nearer to one another; and

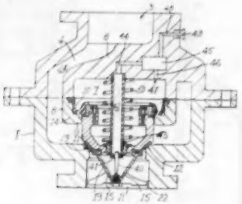
connective means connected to both of said valve elements which connective means conveys movement of one of said valve elements to the other to close one when the other is opened by fluid flow.

3,974,849

DIAPHRAGM VALVES

Peter L. Dawson, 5 Chenik St., Shandor Industrial Sites, Krugersdorp, Transvaal, South Africa

Filed Sept. 4, 1974, Ser. No. 503,102
Int. Cl.² F16K 31/165
U.S. Cl. 137—221 **10 Claims**



1. A diaphragm operated valve, comprising: a valve body having an inlet and an outlet; and an inner wall within said valve body; a valve seat between the inlet and outlet; a rigid, reciprocable valve closure member movable in the valve body toward and away from the valve seat and having a hard, rubber-like seating surface for movement into and out of closing relationship with the valve seat; and a separate, annular valve-operating diaphragm of flexible, rubber-like material having an inner peripheral portion with an inner edge thereon and an outer peripheral portion with an outer edge thereon and secured around its inner edge to the closure member and around its outer edge to the valve body inner wall so that a chamber is defined between the inner wall and the diaphragm and closure member which chamber is located between the inlet and outlet; the closure member having an opening defined therein leading into the chamber; pilot valve means in fluid communication with said chamber to be operatively connected with said diaphragm to control application of fluid pressure to said diaphragm to operate said valve; the inner peripheral portion of the diaphragm having a thickness substantially greater than the outer peripheral portion thereof so that the diaphragm outer portion is thin relative to the diaphragm inner portion, the differences in thickness from the outer peripheral portion to the inner peripheral portion being gradual and free of stress-inducing sudden transitions; the valve body inner wall having an extension directed toward the closure member from the inner wall and located between the diaphragm and the inlet to define a ledge positioned to contact and accommodate the thin outer portion of the diaphragm when the valve is closed and fluid pressure is applied to the diaphragm for supporting the diaphragm thin portion when the valve is closed and pressure is applied to the diaphragm.

3,974,850

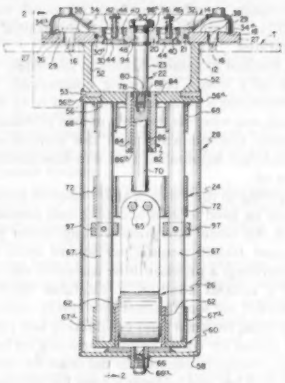
HIGH VOLUME FLUID PRESSURE RELIEF VALVE

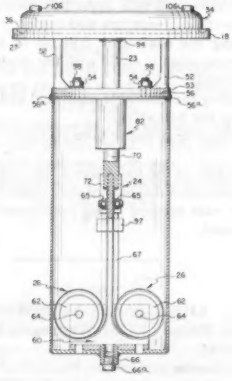
Karl B. Pierson, Warren, Pa., assignor to Betts Machine Company, Warren, Pa.

Filed Apr. 24, 1975, Ser. No. 571,229
Int. Cl.² F16K 17/26
U.S. Cl. 137—493.9 **20 Claims**

1. In a fluid pressure relief valve for the vent opening in a fluid storage tank comprising, a valve member reciprocal to and from the vent opening to seal the same and when open to exhaust fluid pressure in the storage tank, means for retaining said valve member in normally closed condition, the last mentioned means comprising constant force spring means whereby the force required to move said valve member against the resistance of said last mentioned means remains substantially constant throughout the travel of the valve member, and including a base seat having an aperture adapted for disposal in communication with the vent opening, said valve member including sealing means adapted for sealing coaction between said member and said aperture in said base seat when said valve member is in said closed condition, said base seat having an upwardly facing exterior groove therein, said valve member including a laterally projecting cover portion which includes a downwardly projecting edge received within said groove and below the upper surface of said base seat which is adjacent said groove.

13. In a fluid pressure relief valve for the vent opening in a fluid storage tank comprising, a valve member reciprocal to





and from the vent opening to seal the same and when open to exhaust fluid pressure in the storage tank, means for retaining said valve member in normally closed condition, the last mentioned means comprising constant force spring means whereby the force required to move said valve member against the resistance of said last mentioned means remains substantially constant throughout the travel of the valve member, and including valve means coacting with said valve member and providing for in-breathing of the valve mechanism when the latter is in mounted condition on an associated tank.

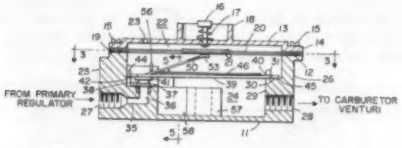
3,974,851
DEMAND TYPE GOVERNORS

Keith H. Garretson, Mt. Pleasant, Iowa, assignor to Garretson Equipment Co., Inc., Mt. Pleasant, Iowa

Continuation-in-part of Ser. No. 438,227, Jan. 31, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 614,851

Int. Cl.² F16K *31/12*

U.S. Cl. 137—494 **10 Claims**



1. In a demand pressure governor for supply of gaseous fluid, the governor including a housing having a gaseous fluid inlet thereto and a gaseous fluid outlet therefrom, the inlet being communicable with a source of gaseous fluid having a first fluid pressure and terminating within the housing in valve means movable to provide valve closed and increasing valve open positions; means effective to bias the valve means to the valve closed position; pressure responsive means movable in response to pressures communicable to the housing through the fluid outlet less than a second fluid pressure; and valve actuating means associated with the valve means and the pressure responsive means for moving the valve means against the biasing means from the valve closed position to increasing valve open positions as the pressure in the housing decreases through the fluid outlet from the second fluid pressure, the improvement wherein the valve actuating means provides the valve means with at least two different rates of valve opening movement for a given rate of movement of the pressure responsive means, said valve opening rates comprising a lesser rate of movement between the valve closed position and an intermediate valve open position, and a greater rate of movement between said intermediate position and subsequent increasing valve open position, the valve actuating means including: valve lever means having first and second fulcrum points disposed between first and second spaced locations thereon, the first lever location being operatively associated with the valve means and the second lever location operatively associated with the pressure responsive means, the lever means being mounted for rocking movement successively about the first and second fulcrum points.

3,974,852
HOSE RUPTURE VALVE

Torbjorn Svensson, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Nov. 27, 1974, Ser. No. 527,617

Claims priority, application Sweden, Nov. 30, 1973, 73162505

Int. Cl.² F16K *17/24, 31/363*

U.S. Cl. 137—498 **6 Claims**

1. A hose rupture valve adapted to be located in a pressure fluid line and comprising

a housing having inlet and outlet openings,

a perforated flow restriction disc arranged within said housing substantially transversely of the flow direction of the pressure fluid through said housing between said inlet and outlet openings,

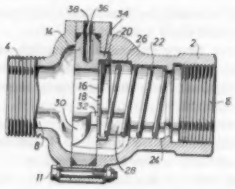
a spring normally biasing said disc in a direction towards said inlet opening,

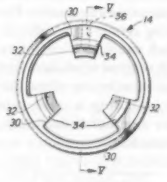
said housing including a stop device for limiting the spring biased movement of said disc,

said housing defining restricted by-pass passages around the outer peripheral edges of said disc,

said disc being movable against the force of said biasing spring in a direction towards said outlet opening into abutment against a peripheral seat defined within said housing which surrounds and defines a flow cross section in the valve which is smaller than the area of said restriction disc to thereby close said valve in response to the condition when the inlet pressure exceeds the outlet pressure by more than a predetermined limit which is normally exceeded upon rupture of a hose connected to said outlet opening,

said valve housing including means for adjustably varying the cross section of said by-pass passages to thereby





determine the fluid flow rate through said by-pass passages at which the inlet pressure exceeds the outlet pressure by said predetermined limit to move said disc and close said valve,

said means for adjustably varying the cross section of said by-pass passages comprising a blocking member which is movable in a plane extending transversely of the flow direction of the pressure medium to adjustably block the by-pass passages more or less in response to the transverse movement thereof.

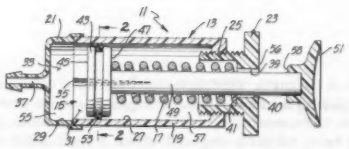
3,974,853
DRIP IRRIGATION VALVE WITH SPRING BIASED PLUNGER

Clarence Bentley, 9256 Stamps Ave., Downey, Calif. 90240

Filed Oct. 17, 1975, Ser. No. 623,440

Int. Cl.² F16K *31/12*

U.S. Cl. 137—503 **11 Claims**



1. A drip irrigation valve comprising:

an outer member having an inner surface defining a passage;

an inner member having an outer surface, said inner member being receivable in said passage of the outer member with said surfaces being generally in confronting relationship, said members being relatively axially movable, said inner member having a pressure responsive face in said passage;

one of said members having a groove in said surface thereof, said groove having a plurality of regions with each of said

regions having a different cross sectional area, said groove extending in a first direction, at least one component of said first direction extending axially of said one member;

a seal carried by the other of said members and engageable with at least a first region of the surface of said one member in sealing relationship to form a fluid barrier;

means for admitting fluid to said passage on one side of the fluid barrier so that the fluid can act on the pressure responsive face of the inner member and urge the inner member in one axial direction relative to the outer member;

means for discharging fluid from said passage on the other side of said fluid barrier;

said groove being extendible through the fluid barrier to provide a flow path through the fluid barrier whereby fluid can flow from the admitting means to the discharging means;

resilient means for resiliently urging the inner member in a direction to oppose the fluid force on the pressure responsive face whereby the region of the groove which extends through the fluid barrier and the flow through the fluid barrier are dependent upon the pressure of the fluid acting on the pressure responsive face; and

said members being relatively axially movable to a flushing position in which the seal is out of engagement and sealing relationship with at least said first region of said surface of said one member to allow flow past the seal, said inner member including a stem extending through one end of the outer member to facilitate relative axial movement of said members.

3,974,854

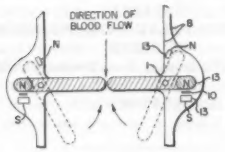
VALVE PARTICULARLY ADAPTED FOR UTILIZATION IN CONTROLLING THE FLOW OF BLOOD

Waldemar Helmut Kurpanek, Mercator Str. 3, 4 Duesseldorf 11, Germany

Division of Ser. No. 287,062, Sept. 7, 1972, Pat. No. 3,874,002. This application Jan. 15, 1975, Ser. No. 541,104

Int. Cl.² F16K *15/03*

U.S. Cl. 137—512 **4 Claims**



1. A magnetic unidirectional fluid flow valve particularly controlling the flow of blood comprising at least one elongated valve flap constructed of non-magnetic material, said valve flap being hingedly disposed within a conduit for movement under the force of pressure of a fluid medium in said conduit between a first conduit closing position and a second conduit opening position; magnetic means disposed in both said valve flap and said conduit providing a magnetic force therebetween resisting movement of said valve flap from said first position toward said second position and further effecting a return of said valve flap from said second position to said first position upon a drop in the pressure of the fluid medium within said conduit; means for delimiting the travel of said valve flap in both said positions; and wherein an elastic diaphragm means is disposed about said valve flap and the surrounding area of said conduit.

3,974,855

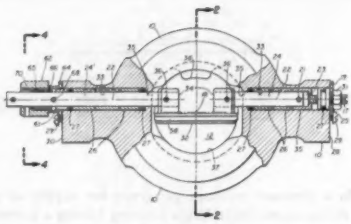
CHECK VALVE HAVING SELF ENERGIZING SEAL

Anthony M. Webb, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Sept. 30, 1975, Ser. No. 618,127

Int. Cl.² F16K *15/00*

U.S. Cl. 137—527.4 **7 Claims**



1. A check valve comprising:

a. a body having a substantially circular first opening therethrough for the flow of fluid, and parallel faces perpendicular to the first axis of said first opening, one of said faces being an upstream face, and the other a downstream face, said body adapted to be clamped between spaced parallel pipe flanges;

b. a second cylindrical opening through said body, the second axis of said second opening perpendicular to said first axis, and displaced a selected distance from said first axis in a direction parallel to said faces, and shaft means journaled in said second opening;

c. circular ring seal means having a seating surface inserted into said body on said upstream face, said seal ring means comprising a ring of rigid material, the seating surface of which comprises a conical surface, said conical surface tapering toward said upstream face, and tangent to a sphere having a center at the point where said first axis intersects a perpendicular plane passing through said second axis;

d. disc means rigidly fastened to said shaft means and having a circular face, and conical tapered edge, the angle of said conical taper being the same as that of said seating surface;

e. a circumferential rectangular groove in said tapered edge, the base of said groove cylindrical, and coaxial with said disc, the walls of said groove perpendicular to the cylindrical base of said groove, the plane through the center of said groove displaced a selected distance along said first axis from said perpendicular plane toward said upstream face; and

f. O-ring means in said groove;

whereby when said shaft is turned so that the plane of said disc is parallel to the plane of said ring seal means, said O-ring will press against said seating surface and seal the fluid passage through said first opening.

3,974,856

DISTRIBUTOR PANEL OR BOARD FOR COMPRESSED AIR MONITORING SYSTEMS

Peter Lancier, Munster-Angelmode, Germany, assignor to Peter Lancier K.G. Maschinenbau-Hafenhuette, Wolbeck, Germany

Filed Nov. 26, 1975, Ser. No. 635,378

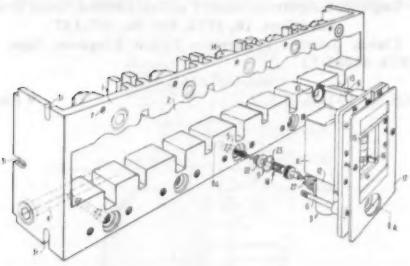
Claims priority, application Germany, Dec. 19, 1974, 2460295

Int. Cl.² G08B *21/00;* **F16K** *37/00*

U.S. Cl. 137—552 **9 Claims**

1. A distributor board or panel for compressed air monitoring systems, used preferably for electric cables under air pressure, comprising:

A. a common distributor housing fabricated as an integral die-cast element, said housing having:
i. a longitudinally extending common compressed air line;
ii. a plurality of air supply lines branching off at right angles from the common compressed air line;
iii. an equal plurality of air outlet lines which lead to cable connections; and
iv. a longitudinally extending opening and surrounding structure;
B. a plurality of flow detectors equal in number to the plurality of air supply lines, each said flow detector including a control pin and each said flow detector having



means for producing a signal when a predetermined variable air flow is exceeded;
C. mounting means for mounting each flow detector to the surrounding structure of the distributor housing forming thereby a row of adjacently arranged flow detectors each in registry with a respective air supply line and air outlet line; and
D. a plurality of automatic closing stop valves each located in respective one of the air supply lines so that the control pin of the flow detector associated with the respective air supply line within which the stop valve is located can engage and open the stop valve.

3,974,857

DEVICE FOR MONITORING AND ADJUSTING THE TEMPERATURE OF MULTIPLE COOLING CIRCUITS

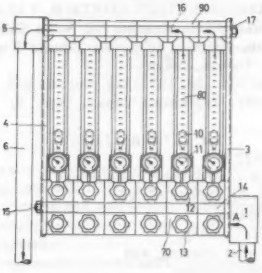
Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg, Germany

Filed June 27, 1974, Ser. No. 483,708

Claims priority, application Germany, July 23, 1973, 2337410

Int. Cl.² G01F *1/00*; G08B *21/00*

U.S. Cl. 137—559 **12 Claims**



1. A device for selectively monitoring and adjusting the temperatures of a number of heat-generating components of a production machine in conjunction with separate cooling circuits for said components, in each of which a cooling liquid flows through a cold liquid supply line to the machine component, removes heat from the latter, and returns through a hot liquid return line, the device comprising in combination:
a plurality of vertically oriented cooling circuit monitoring units arranged laterally adjacent to each other in a row, so as to form a monitoring bank, each unit including:
a distributor manifold at its bottom end having a transverse conduit ending in opposite lateral connections adapted for joining to the manifolds of adjacent units so as to form a continuous inlet conduit therethrough, the manifold further including a first circuit connector linking said conduit to the cold liquid supply line of a cooling circuit, a seating sleeve at the upper end of the manifold, and a second circuit connector extending the hot liquid return line to the inside of said seating sleeve;
a vertically oriented float-type flow gauge connected by its lower end to the seating sleeve of the manifold, the flow gauge having a calibrated gradually widening inner profile through which the returning hot liquid flows upwardly past a float which is verticcally movable therein, the height to which the float is lifted being visuallly ascertainable as an indication of the rate at which the liquid circulates in the cooling circuit;
a head at the top end of the unit having likewise a transverse conduit ending in opposite lateral connections adapted for joining to the heads of adjacent units so as to form a continuous outlet conduit therethrough, the head further including a seating portion to which the upper end of the flow gauge is connected in such a way that it communicates with said outlet conduit;
a temperature gauge arranged in the hot liquid return line ahead of said seating sleeve and indicating the temperature of the returning hot liquid; and
valve means associated with at least one of said circuit connectors for adjusting the speed at which cooling liquid flows through the cooling circuit monitoring unit; and wherein
the first monitoring unit on one end of the monitoring bank includes on its head a head cover member closing the outlet conduit at that end of the bank, and on its manifold an inlet connecting flange communicating with the inlet conduit of the distributor manifolds; and
the last monitoring unit on the other end of the monitoring bank includes on its head an outlet connecting flange communicating with the outlet conduit, and on its manifold a manifold cover member closing the inlet conduit at that end of the bank; the device further comprising:
means for longitudinally clamping together the units, their cover members and connecting flanges; and
an inlet line supplying cold cooling liquid to the bank, while an outlet line removes the hot liquid from the bank.

3,974,858

REGULATION VALVES

Ove Hjortborg Nielsen, Langaa Hesselager, Denmark, assignor to A/S Dansk Metal- & Armaturindustri, Denmark

Filed Mar. 4, 1974, Ser. No. 447,815

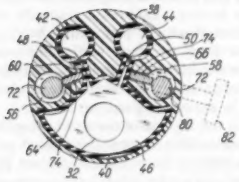
Claims priority, application United Kingdom, Mar. 12, 1973, 11760/73

Int. Cl.² F16K *19/00*

U.S. Cl. 137—606 **12 Claims**

1. A regulating valve, such as especially a water tap or mixing valve, having two individual inlet passages, an outlet passage, and a valve passage for communicating each individual inlet passage with said outlet passage, the cross-sectional area of each of said valve passages being adjustable by means of a movable valve actuator means, characterized in that each valve passage is shaped as an elongated valve slot in a wall of each inlet passage, each of said valve slots extends generally

in the axial direction of each inlet passage with each slot being formed between opposed edges which are operatively connected with the valve actuator means so as to be substantially parallely displaceable towards and away from each other.



3,974,859

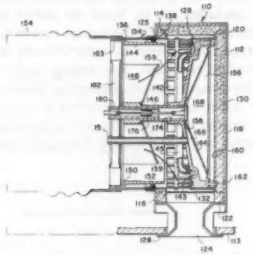
AIR DISTRIBUTION REGULATOR APPARATUS

John C. McNabney, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Aug. 19, 1974, Ser. No. 498,826

Int. Cl.² F16K *31/126*

U.S. Cl. 137—625.37 **14 Claims**



1. Air distribution apparatus comprising; an air plenum chamber having front and back sheet metal walls spaced from each other; an air outlet opening from said chamber; a generally circular aperture in said sheet metal front wall, that portion of said chamber opposite from said aperture being closed by said back wall; a generally cylindrical sleeve extending axially inward of said inlet opening and having an inner portion disposed inwardly of said inlet opening and an outer portion; retainer means for retaining said sleeve in said inlet opening; an air conveying duct separate from said front wall fastened to the radial outer surface of said outer portion of said sleeve to supply air thereto; means defining at least one first aperture at said inner portion of said sleeve extending radially outwardly communicating the interior of said sleeve with the interior of said plenum chamber; closure means at the end of said inner portion for blocking axial air flow; a generally cylindrically shaped valve disposed radially inwardly of said sleeve; mounting means for mounting said valve for axial movement within said sleeve between a first axial position at least partially outside of said inlet opening and substantially noncoextensive with said first aperture thereby opening said first aperture and a second axial position substantially coextensive with said first aperture thereby substantially closing said first aperture; and means for freely communicating the axial ends of said valve through said valve to thereby substantially balance the axial fluid forces exerted on said valve.

3,974,860

VALVE

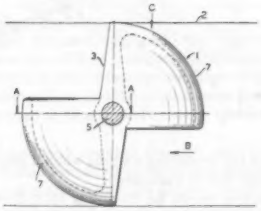
Michael Stead, Wakefield, and Gordon Heap, Leeds, both of England, assignors to Batley Controls Limited, Great Britain

Filed Sept. 18, 1974, Ser. No. 507,137

Claims priority, application United Kingdom, Sept. 26, 1973, 45085/73

Int. Cl.² F16K *47/04*

U.S. Cl. 137—625.3 **9 Claims**



1. A vane for a fluid flow control valve having a body, comprising: a disc shaped member mountable for rotation about a first axis in or parallel to the plane of and passing through or near to the center of said disc shaped member, and at least one flow modifying member for seating on the body and depending arcuately and radially inwardly from a peripheral portion of said disc shaped member to at least a second axis perpendicular to and passing through said first axis, said flow modifying member being shaped arcuately to seat against the valve body for any predetermined degree of rotation of said disc shaped member, said flow modifying member having one or more openings therethrough for fluid flow, wherein for any degree of opening of the valve vane, all of the fluid flow is through said one or more openings, and when the valve vane is in a closed position the fluid flow is stopped by said disc shaped member.

3,974,861

AIR FLOW DIRECTION CONTROL VALVES

Kenji Goto; Yukihide Hashiguchi, and Norio Shibata, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Filed Mar. 28, 1975, Ser. No. 562,967

Claims priority, application Japan, Sept. 9, 1974, 49-103582

Int. Cl.² F16K *11/10*

U.S. Cl. 137—627.5 **25 Claims**

1. An air flow control valve comprising:

a housing having defined therein:

an inlet opening,

a first outlet opening,

a second outlet opening, and

a third outlet opening;

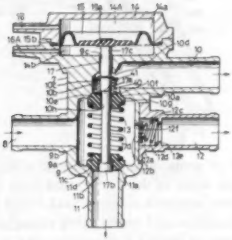
a shaft axially movable between a first position and a second position and from a neutral position thereof; said shaft having a pair of spaced mutually facing shoulders thereon;

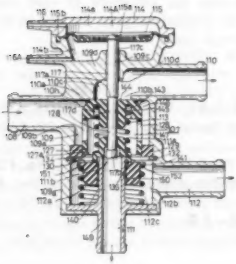
a first valve member coaxial with and encircling said shaft, said first valve member being spaced from one of said

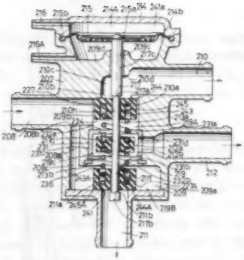
shoulders and closing said first outlet opening when the shaft is in said neutral position and being engagable and moved in one direction by said one shoulder when said shaft is moved into said first position to open said first outlet opening;

a second valve member coaxial with and encircling said shaft, said second valve member being spaced from the other one of said shoulders and closing said second outlet opening when the shaft is in said neutral position and being engagable and moved in a direction opposite to said one direction by said other shoulder when said shaft is moved into said second position to open said second outlet opening;

a third valve member disposed coaxially with respect to said first valve member and said second valve member, said







third valve member fluidly communicating said inlet opening and said third outlet opening when said first outlet opening and said second outlet opening are closed respectively by said first valve member and said second valve member;

first resilient means, connected at one end to said first valve member and connected at the other end to said second valve member, for biasing said first and second valve members toward said first and second outlet openings respectively for closing thereof; and

second resilient means connected to said third valve member for biasing same.

3,974,862

FLEXIBLE CONDUIT

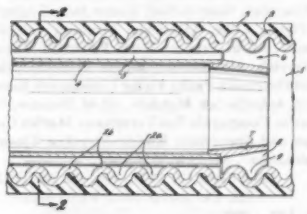
Siegfried Führmann, Gleidingen, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Apr. 28, 1975, Ser. No. 571,933

Claims priority, application Germany, May 15, 1974, 7417030[U]

Int. Cl.[2] F15D *0/00*; **F16L** *11/00, 9/18*

U.S. Cl. 138—37 **6 Claims**



1. Conduit assembly for the conduction of fluids and including an inner and an outer tube, the outer tube being helically or annularly corrugated having alternatingly inwardly and outwardly extending corrugation crest, whereby each corrugation crest on the inside is a corrugation valley on the outside, the improvement comprising:

the inner tube being flexible and without corrugations, the inner tube having ribs extending in radially outward direction and engaging the inwardly extending corrugation crests of the said outer tube, said ribs running predominantly or exclusively in longitudinally axial direction, thereby extending transversely to said corrugation crest, so that fluid can flow in axial direction along the outside of the inner tube, across the corrugation crests.

3,974,863

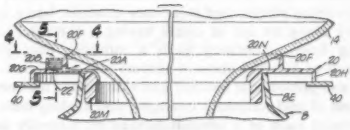
VALVED WATER CONTAINER WITH SEAL

Carl E. Frahm, and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91106

Division of Ser. No. 494,464, Aug. 5, 1974. This application Feb. 27, 1975, Ser. No. 553,747

Int. Cl.[2] B67D *5/62, 5/60*

U.S. Cl. 141—18 **1 Claim**



1. An element for positioning between, on the one hand, a housing for a water reservoir having a mouth portion and, on the other hand, an inverted replaceable water container with said element serving the functions of mounting, sealing and venting, said element being annular and having a base portion, a first relatively heavy sealing and mounting portion extending downwardly from said base portion for entering and snugly engaging an inner wall portion of said mouth portion to provide not only a firm support for the water container but also as a seal, a second relatively thin, flexible and tapered sealing ring portion on said base portion positioned outwardly of said first portion and extending upwardly from said base portion and being the sole means to engage said container, said second portion having a vent apertured portion extending therethrough, a third portion near the periphery of said base portion and extending downwardly therefrom for sealingly contacting a flat surface of said housing for said reservoir, (to

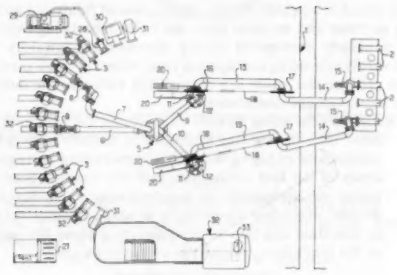
engage a portion of the housing in which said reservoir is mounted), said second portion being located between said first portion and said third portion and being joined to said first portion by a relatively thin circular portion, (rigidly supported by said first and said third portion when said water container is positioned to said mouth portion).

3,974,864

DEVICE FOR LOADING AND UNLOADING CARGO VESSELS FOR CONVEYING GASEOUS, LIQUID OR FLUIDIZED SOLID MATERIALS

Pierre Fournier, Noisy-le-Sec; Andre Jules Legleye, Vernouillet; Pierre Colle, Ozoir la Ferriere; Claude Michaut, Mennecy, all of France; Boris Petrovich Timofeev; Adolf Moritsovich Alexandrov; Ruben Dzhangirovich Balaian; Leonid Ozerovich Patik; Victor Leontjevich Berezovsky, and Leonid Arkadjevich Matzkin, all of Moscow, U.S.S.R., assignors to Compagnie Des Terminaux Marins Coterm, Paris, France and Spetsialnoe Konstruktorskoe Bjuro "Transneftteavtomatika", Moscow, U.S.S.R.

Filed Sept. 18, 1974, Ser. No. 507,192
Int. Cl.² B67D *5/00*; F17D *1/00*
U.S. Cl. 141—100 **5 Claims**



1. A device for loading gaseous, liquid and fluidized solid materials from on-shore plants into tanks of board vessels and inversely, comprising a system of loading lines intended to connect some of said tanks to some of said on-shore plants, the number of loading lines being smaller than the number of on-shore plants and the number of different materials to be loaded, said on-shore plants comprising a plurality of stationary conduits open at one end and connected at another end to said on-shore plants, said stationary conduits being arranged radially along an arc of circle having a central point, said loading lines comprising each a movable duct pivotably mounted at one end about a vertical axis at the said central point and provided at another end with means for connecting it to one of said stationary conduits, said loading lines further comprising each of a conduit formed by hingedly interconnected duct means movable in vertical and horizontal planes respectively, this latter conduit being connected at one end to the said movable duct at said vertical axis and being provided at an other end with means for connecting it to one of said tanks.

3,974,865

VAPOR COLLECTING NOZZLE

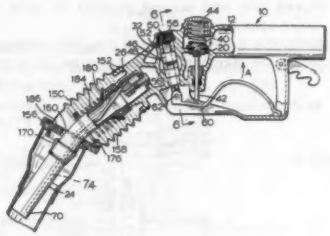
David T. Fenton, Madison, and Allen M. Bower, Painesville, both of Ohio, assignors to Emco Wheaton Inc., Conneaut, Ohio

Filed Jan. 21, 1975, Ser. No. 542,857
Int. Cl.² B65B *3/18*; B67C *3/34*
U.S. Cl. 141—311 R **2 Claims**

1. In an automatic nozzle having, a main body, a liquid fill tube projecting from the main body, a longitudinally collapsible vapour recovery shroud extending from said main body about said filling tube, said shroud having a sealing ring at the outer end thereof for engaging the filling pipe of a fuel storage tank, the improvement of,

a. a collar movably mounted on said liquid filling tube and disposed between said main body and said sealing ring,

b. compression spring means mounted on said liquid filling tube between said collar and said main body, said compression spring means urging said collar in a direction away from said main body,



c. a pair of arms mounted on said collar on diametrically opposite sides of the collar, said arms being spaced laterally from opposite sides of said liquid filling tube,

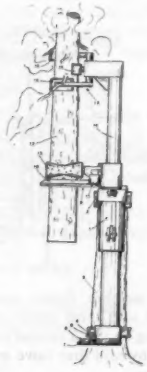
d. seat means in said sealing ring engaging the outer ends of said arms to permit said sealing ring to pivot about a first axis extending transversely between the outer ends of said arms under the influence of said compression spring means to sealingly engage the end of the filling pipe of a fuel storage tank.

3,974,866

TREE HARVESTING METHOD AND DEVICE

Tapio Heikki Saarenketo, Ilvespolku 20, 96400 Rovaniemi 40, Finland

Filed Dec. 27, 1973, Ser. No. 428,712
Claims priority, application Finland, Dec. 30, 1972, 3723/72
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D **10 Claims**



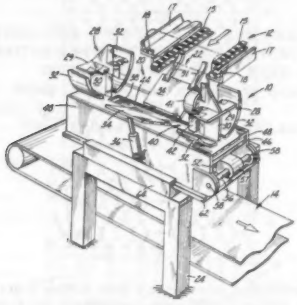
1. A tree harvesting method for limbing and bucking a standing tree by means of a harvesting device moved by a skidder or a corresponding carrier comprising: severing an upper part of a tree from a lower butt portion thereof; limbing and bucking the thus-severed upper part of the tree while maintaining said upper part of the tree in an upright attitude

and before the tree is severed at the lower butt portion thereof; and securing the harvesting device tightly to the lower butt portion of the tree during the said limbing and bucking procedure so that at least a part of the pressure against the harvesting device is transferred to the lower butt portion of the tree during limbing and bucking of the severed upper part of the tree.

3,974,867
LOG SPLITTER

Joseph T. Butas, Jr., 8102 Theota Drive, Parma, Ohio 44129

Filed Apr. 30, 1975, Ser. No. 573,018
Int. Cl.² B27L *7/00*
U.S. Cl. 144—193 A **12 Claims**



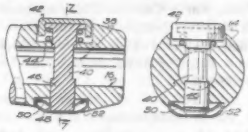
1. A log splitter comprising a frame member having a box-like construction with an elongated aperture in the top thereof, a pair of blade means one permanently positioned at each end of said frame member, adjustable table means positioned between said pair of blade means and supported on said frame member selectably supporting a log relative to the pair of blade means, ram means slidably mounted within said elongated aperture of said frame member, and hydraulic cylinder means attached to said ram means to drive said ram means against one said blade means under expansion conditions and against the other said blade means under contraction conditions.

3,974,868
HAND TOOLS

George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company Limited, Sheffield, England

Division of Ser. No. 526,042, Nov. 21, 1974, Pat. No. 3,935,889. This application Aug. 28, 1975, Ser. No. 608,541
Int. Cl.² B25D *3/00*
U.S. Cl. 145—24 **2 Claims**

1. A hand tool comprising a tool part provided with a tang having an axially extending slot in its free end opening into a crosshole, the diameter of the crosshole being greater than the width of the slot, a handle part having in an end thereof an axially extending aperture for receiving the tang; locking means for releasably locking the handle part to the tang comprising a locking pin extending diametrically through the handle part intermediately of the ends of the aperture and adapted to be moved transversely relative to the handle part, the pin having a first diametrical dimension defining a narrow major length allowing when registered with the slot sliding reception of the tang into the aperture over the pin until the pin is received into the crosshole, the pin having at one end a second diametrical dimension defining an enlarged portion obtaining in a predetermined moved condition of the pin transversely relative to the handle part a position protruding partway into the aperture and into the crosshole of the tang after the latter is received in the aperture so as to lock the tang against axial release from the aperture, and a spring biasing the pin normally to said moved condition; wherein the handle part has a recess at one side coaxial with the pin, the pin has a head at its other end defining an under-shoulder externally of the handle part, the spring is disposed between the under-shoulder and the bottom of the recess, the said one end of the pin projects externally of the handle part and carries a retaining clip, the clip having in said moved condition of the pin a

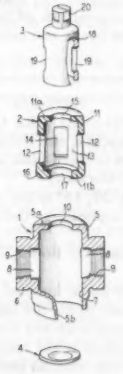


position abutting an adjacent area of the hande part; and wherein the head end of the pin is depressible against the bias of the spring into the recess, and the pin has a moved position when so depressed in which its enlarged portion is displaced clear of the aperture and of the crosshole of the tang received in the aperture and its narrow major length is registered with the slot so as to allow axial release of the tang from the aperture.

3,974,869
FLUID FLOW CONTROL VALVE

Michio Abe, 2-119 Mino-cho, Kasugai, Aichi, and Tomio Urokohara, 4-15 Yasiu-cho, Kita, Nagoya, both of Japan

Continuation of Ser. No. 350,095, April 11, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,780
Claims priority, application Japan, Apr. 13, 1972, 47-37260
Int. Cl.² F16K *5/02, 5/06*
U.S. Cl. 251—309 **7 Claims**



4. A four piece valve cock which comprises an as cast metal housing having an axial open end and laterally extending bosses providing housing ports, a hollow cold formed metal

plug in said housing having plug ports adapted to selectively register with said housing ports and a shaft portion projecting from the housing, a rigid but resilient and stretchable plastics material bearing member in said housing stretched over and enveloping said hollow plug and surrounding the shaft of the plug, said bearing having bearing ports permanently registering with said housing ports and selectively registering with said plug ports, a metal closure disc pressed into the open end of said housing against said bearing to a depth creating a desired compression preload on the bearing, means on said housing overlying the closure disc for maintaining said depth in the housing, and said stretched and compressed bearing having internal stresses attempting to regain the free state of the bearing to contract around the plug and expand against the housing and closure disc while supporting the plug for movements controlling flow through the plug between the housing ports and simultaneously sealing the plug and its shaft to prevent leakage out of the housing.

3,974,870

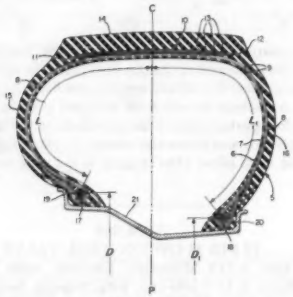
TIRE WITH UNEQUAL BEAD DIAMETERS

George T. Watts, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 28, 1974, Ser. No. 473,648

Int. Cl.² B60C *3/00, 13/00*

U.S. Cl. 152—352 R **5 Claims**



1. A tire comprising at least one carcass ply, a tread and pair of sidewalls surrounding the carcass ply and terminating at a pair of annular beads of different diameters, and characterized in that the contour lengths (L) and (L_1) of the sidewalls, measured along the neutral axis of the carcass plies between the center axes of the beads and centerplane of the tire, are equal.

3,974,871

ANTI-SKID TIRE CHAIN

Anton Müller, Unterkochen, and Hubert König, Aalen, both of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Germany

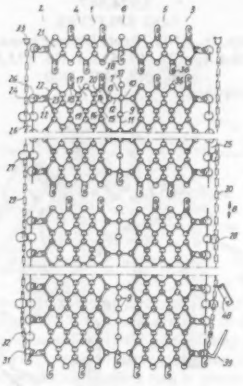
Filed Jan. 27, 1975, Ser. No. 544,559

Claims priority, application Germany, Jan. 29, 1974, 2404055

Int. Cl.² B60C *27/06*

U.S. Cl. 152—220 **6 Claims**

1. An anti-skid tire chain for dual tires collectively having a length at most as great as the tire circumference comprising; a tread part for engaging each tire tread, side parts connected to the axially outer edges of the tread parts for engaging the axially outer sides of the tires, an intermediate part extending laterally between and interconnecting said tread parts and also extending throughout the length of the chains, said intermediate part being flexibly connected to said tread parts and expandable at least in a transverse direction and being substantially restricted in the direction of the length of the chain, said intermediate part including a chain strand which extends in the circumferential direction of the tires when the chain is mounted thereon, said intermediate part including a chain net which extends in the circumferential direction of the tires when the chain is mounted thereon, said chain net being connected at the side edges to spaced points along the adjacent axial edges of said tread parts of the chain, said intermediate part including chain means, each tread part along the



edges adjacent said intermediate part having pairs of chain links which are spaced along the said edges, the links of each pair converging toward the intermediate part, and a ring member to which each pair of chain links and a corresponding point on the intermediate part are connected, said tread parts being formed of interconnected chain links and forming chain configurations, said intermediate part also being formed of interconnected chain links and forming chain configurations of a size greater than those of the tread parts.

3,974,872

METHOD AND APPARATUS FOR PRODUCTION OF CASTING MOLDS

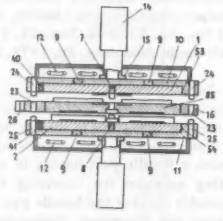
Erwin Buhrer, Vogelingasschen 40, Schaffhausen, Switzerland

Filed Dec. 17, 1973, Ser. No. 425,493

Claims priority, application Switzerland, Oct. 9, 1973, 14384/73; Dec. 27, 1972, 18873/72

Int. Cl.² B22C *15/22*

U.S. Cl. 164—40 **22 Claims**



1. A method for producing foundry mold sections from a mold-forming material having a resin binder comprising the steps of arranging at least two movable pattern plates each having a pattern surface formed thereon in opposed relationship with said pattern surfaces facing each other, disposing between said pattern plates a frame adapted to define together with said pattern plates a mold-forming cavity having a single continuous fixed volume which is peripherally enclosed by said frame when said plates are brought into engagement with said frame therebetween, moving both said pattern plates together into engagement with said frame to form said mold-forming cavity with said pattern plates spaced by said frame

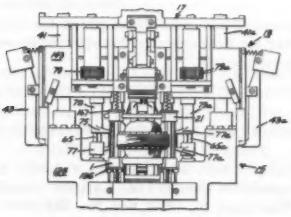
a fixed predetermined distance apart, blowing into said mold-forming cavity said mold-forming material having a resin binder through means connected to said frame, holding said pattern plates and said interposed frame in a fixed relationship relative to each other during setting of said mold-forming material within said cavity thereby to form a mold section, said pattern plates and said frame being thus held by means engaging said pattern plates, separating said pattern plates and said frame by moving said pattern plates away from said frame while holding said frame stationary after formation of said mold section by utilization of means engaging said pattern plates and said frame, and thereafter removing said mold section from said frame.

3,974,873

METHOD FOR ATTACHING AN END FRAME AND ANOTHER STRUCTURAL COMPONENT OF A DYNAMOELECTRIC MACHINE

Jesse A. Stoner, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sept. 14, 1973, Ser. No. 397,425
Int. Cl.[2] B22D *19/04*
U.S. Cl. 164—108 **29 Claims**



1. A method of attaching an end frame and another structural component of a dynamoelectric machine comprising the steps of:

a. positioning the end frame and the structural component in an apparatus adapted to be actuated for automatically assembling them in an aligned assembly position with the structural component disposed within means for receiving it provided in the end frame;

b. moving at least one of the end frame and the structural component with respect to the other thereof to the aligned assembly position upon actuation of the apparatus which effects such movement; and

c. casting a metal into the receiving means for forming a rigid tie between the end frame and the structural component as as to fixedly interconnect them in the aligned assembly position against displacement therefrom while they are positioned in the apparatus.

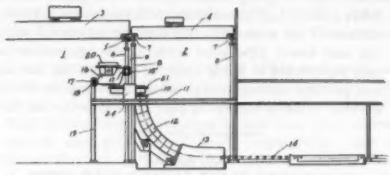
3,974,874

CONTINUOUS CASTING PLANT

Herbert Fastert, Wyckoff, N.J.; Wolfgang John, New York, N.Y., and Karl L. Backhaus, West New York, N.J., assignors to Concast Incorporated, Montvale, N.J.

Filed Nov. 24, 1975, Ser. No. 634,842
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—281 R **9 Claims**

1. In a continuous casting plant comprising a ladle shop, an adjoining separate casting shop, and a separate traveling crane on a separate pair of tracks located within and serving each shop, said pairs of tracks being parallel to each other and separated by a space defining a separation zone between said shops, means for supporting a ladle in said ladle shop, a ladle positioned thereon, means for supporting a mold in said casting shop, at least one mold mounted thereon, and a tundish extending across said separation zone and located at a casting station extending from the ladle shop into the casting shop,



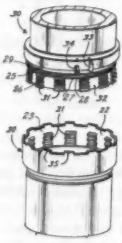
one end of said tundish being located below said ladle and the other end of said tundish being located above said mold.

3,974,875

UNDERWATER WELL COMPLETION METHOD AND APPARATUS

David P. Herd, and John H. Fowler, both of Houston, Tex., assignors to McEvoy Oilfield Equipment Co., Houston, Tex.

Division of Ser. No. 387,667, Aug. 13, 1973, which is a division of Ser. No. 103,839, Jan. 4, 1971, which is a continuation of Ser. No. 792,912, Jan. 22, 1969, which is a continuation-in-part of Ser. No. 728,081, May 9, 1968, Pat. No. 3,442,536, which is a continuation of Ser. No. 572,511, Aug. 15, 1966. This application Aug. 22, 1974, Ser. No. 499,468
Int. Cl.[2] E21B *43/01*
U.S. Cl. 166—.5 **4 Claims**



1. A string of pipe installed in substantially vertical position with a portion of said pipe string buried in the sea floor and a portion of it suspended in the water above said sea floor, comprising

male and female coupling elements rigidly affixed to adjacent ends of upper and lower joints of said pipe string, with the male element telescopically received within the female element,

a plurality of circumferentially spaced-apart no-lead threads on the inner circumference of said female element and on the outer circumference of said male element,

the threads on each being in alignment with the spaces between the threads on the other element, said threads being engaged with each other to prevent said pipe joints from moving axially apart the application of a tension force thereon,

an annular shoulder on one of said elements in engagement with the other element preventing said pipe joints from moving axially toward each other,

a fixed stop on one of said elements in engagement with the other element positioned to prevent relative rotation of said elements in one direction, and

a movable latch on one of said elements in engagement with the other element positioned to prevent relative rotation of said elements in the other direction, and adapted to be moved to allow disengagement of said elements by relative rotation of said elements in said other direction without relative axial movement, followed by relative axial

movement of said pipe joints away from each other in the absence of relative rotation,

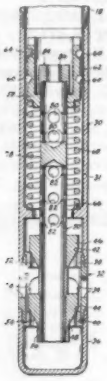
whereby said coupling elements may be engaged with each other and latched to maintain such engagement above the surface of the water, provide support means for supporting said lower pipe joint without disengagement while said pipe string is being lowered through the sea water, and provide means through which a driving force may be exerted to drive the lower pipe joint into the sea floor.

3,974,876

DOWNHOLE FLUID FLOW REGULATOR

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108

Filed Sept. 15, 1975, Ser. No. 613,767
Int. Cl.[2] F16K *31/163*, *31/36*
U.S. Cl. 166—65 R **7 Claims**



1. A fluid flow regulator, comprising:

a tubular housing having an inlet end and a closed end and having an annular shoulder intermediate its ends;

a tubular cage interposed in the housing between said annular shoulder and the closed end,

said cage having a lateral port forming the outlet of a flow passageway through said housing and said cage,

said cage having a pair of valve seats facing toward the housing inlet end and disposed, respectively, on the upstream and downstream sides of the lateral port;

a sleeve piston intersecting the flow passageway and being loosely received by said housing adjacent its inlet end for forming a restricted annular flow passageway around said piston;

an elongated tube connected with the bore of said sleeve piston and projecting through said cage;

a pair of valves secured in spaced relation to the periphery of said tube for seating and unseating on said valve seats and opening and closing the fluid passageway in response to movement of said sleeve piston toward and away from said cage;

resilient means interposed between said shoulder and said sleeve piston normally biasing said piston toward the housing inlet end in a valve unseating position; and,

means associated with said sleeve piston for increasing or decreasing the flow capacity through said housing a predetermined quantity.

5. In combination with a casing suspended within a borehole passing through a water producing formation spaced above an oil containing formation, said casing forming a fluid passageway and containing a motor driven pump for forcing fluid downwardly through the passageway, electrical conductors connecting a source of electrical energy with said motor and packing means sealing an intermediate peripheral portion of said casing with the borehole wall, the improvement comprising:

a tubular housing depending from said casing and having its depending end closed and having an annular shoulder intermediate its ends; a tubular cage interposed in the housing between said annular shoulder and the closed end,

said cage having a lateral port forming the outlet of a flow passageway through said housing and said cage,

said cage having a pair of valve seats facing toward the upper end of said housing and disposed, respectively, on the upstream and downstream sides of the lateral port;

a sleeve piston intersecting the flow passageway and being loosely received by said housing adjacent its upper end for forming a restricted annular flow passageway around said piston;

an elongated tube connected with the bore of said sleeve piston and projecting through said cage;

a pair of valves secured in spaced relation to the periphery of said tube for seating and unseating on said valve seats and opening and closing the fluid passageway in response to movement of said sleeve piston toward and away from said cage;

resilient means interposed between said shoulder and said sleeve piston normally biasing said piston toward the upper end of the housing in a valve unseating position; and,

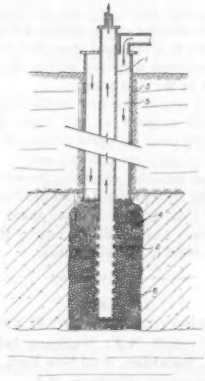
means associated with said sleeve piston for increasing or decreasing the flow capacity through said housing a predetermined quantity.

3,974,877

SAND CONTROL METHOD EMPLOYING LOW TEMPERATURE OXIDATION

David A. Redford, Fort Saskatchewan, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Canada

Filed June 26, 1974, Ser. No. 483,481
Int. Cl.[2] E21B *43/04*, *43/12*
U.S. Cl. 166—276 **15 Claims**



1. A method of treating a subterranean, petroleum containing formation penetrated by at least one well, said well being in fluid communications with the subterranean formation, for the purpose of forming a permeable solid barrier which restrains the movement of sand particles and permits passage of fluid therethrough, comprising:

a. introducing a predetermined quantity of granular material in the well bore adjacent the formation;

b. introducing bituminous petroleum into the granular material by forming a bituminous petroleum-in-water emulsion, pumping the emulsion into the granular material, and then contacting the emulsion in the granular material with an acid to break the emulsion and deposit bitumen on the granular material; and

c. injecting a mixture of steam and an oxygen containing gas into the bituminous petroleum granular mixture for a predetermined period of time sufficient to form a competent, permeable solid.

13. A method of treating a subterranean, petroleum containing formation penetrated by at least one well, said well being in fluid communication with the subterranean formation, for the purpose of forming a permeable solid barrier which restrains the movement of sand particles and permits passage of fluid therethrough, comprising:

a. introducing a predetermined quantity of granular material into the wellbore adjacent the formation;

b. introducing bituminous petroleum into the granular material by forming a solution of bituminous petroleum in an effective solvent, introducing the solution into the granular material and passing a gas through the solution in the granular material to vaporize the solvent and leave the bituminous petroleum in the granular material; and then

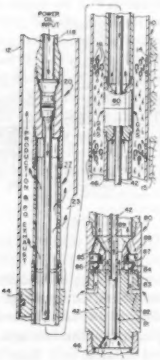
c. injecting a mixture of steam and oxygen-containing gas into the bituminous petroleum granular mixture for a predetermined period of time sufficient to form a competent, permeable solid.

3,974,878

METHOD AND APPARATUS FOR ARTIFICIAL LIFT FROM MULTIPLE PRODUCTION ZONES

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760, and Raymond Hardy, W. Star Rte., Box 740, Lovington, N. Mex. 88260

Filed Sept. 12, 1975, Ser. No. 612,870
Int. Cl.² E21B *43/00, 39/00*
U.S. Cl. 166—314 **15 Claims**



1. In a borehole having a production zone from which hydrocarbon products flow into the lower extremity thereof; artificial lift apparatus for lifting the hydrocarbon products from the borehole, comprising: a fluid actuated pump means having a power fluid inlet, production fluid inlet, spent power fluid outlet, and a produced fluid outlet;

a seal bowl assembly, an upper power fluid string extending downhole in the borehole and connected to said seal bowl assembly, said upper power fluid string being of a size to form an annular flow path respective to the borehole wall;

a vent means, a packer means; and, a produced fluid tubing within which said pump is housed;

means by which said production fluid inlet is flow connected to the lower extremity of the borehole such that the hydrocarbon products flow into the fluid actuated pump;

a lower power fluid tubing located within and coextensive with said produced fluid tubing and forming a lower annulus therebetween, opposite ends of said lower power fluid tubing being connected to said seal bowl assembly and to said power fluid inlet, respectively, such that power fluid flows through said upper power fluid string downhole to said seal bowl assembly, through said seal bowl assembly, into said lower power fluid tubing, and through said lower power tubing to said power fluid inlet of said pump;

means connecting said spent power fluid outlet and said produced fluid outlet to said produced fluid tubing so that spent power fluid and produced fluid flows into said produced fluid tubing;

said vent means being series connected between said produced fluid tubing and said seal bowl;

said packer being positioned in underlying relationship respective to said vent means and arranged to pack-off the produced fluid tubing from the borehole;

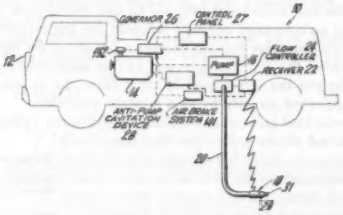
whereby power fluid flows down said upper power fluid string, through said seal bowl assembly, through said lower power fluid tubing to said pump, while spent power fluid and produced fluid flows into said lower annulus, through said packer, out through said vent means, and up the upper annulus where it can flow on to a gathering system.

3,974,879

METHOD AND APPARATUS FOR DELIVERING CONSTANT WATER FLOW RATES TO A FIRE HOSE AT EACH OF A PLURALITY OF SELECTABLE FLOW RATE SETTINGS

George R. Nelson, Jr., New York, and Herman Kaplan, Great Neck, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 14, 1975, Ser. No. 550,044
Int. Cl.² A62C *27/00*
U.S. Cl. 169—43 **8 Claims**



1. A method of delivering constant water flow rates to a fire hose of a fire pumper truck at any one of a plurality of discrete selectable flow rate settings, comprising the steps of:

transmitting a digital signal corresponding to a particular fire hose, a particular fire pumper truck, and a water flow rate;

receiving and decoding the digital signal;

activating a discrete multi-position valve having a plurality of discrete predetermined water flow rate settings with the decoded signal to set the multi-position valve for delivering a predetermined water flow rate to the fire hose; and

adjusting the water flow through the multi-position valve in response to changes in input water pressure and output back pressure to the multi-position valve to maintain the

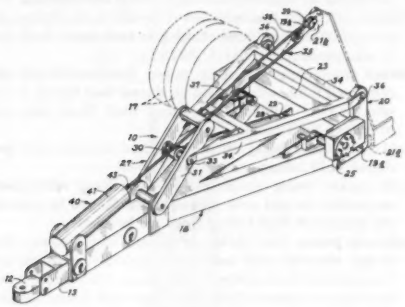
predetermined water flow rate until another corresponding digital signal is transmitted, received and decoded for activating the multi-position valve.

3,974,880

DRAWBAR ASSEMBLY

Alton N. Filan, and A. LaVerne Filan, both of, Rte. 1, Box 69, Waitsburg, Wash. 99361

Filed May 16, 1975, Ser. No. 578,149
Int. Cl.² A01B *59/042, 63/118*
U.S. Cl. 172—443 **7 Claims**



7. A drawbar adapter assembly for connecting a three-point hitch component to a single point hitch draft vehicle, comprising:

a first framework;

a forward connector member of first said framework for operative engagement with a complementary hitch member of a draft vehicle;

a secondary framework mounted to said first framework for pivotal movement about a horizontal pivot axis and having three rearwardly facing three-point hitch connectors thereon for operative engagement with complementary connectors of a three-point hitch implement;

wheel means for movably supporting the first and second frames above the ground surface;

jack means interconnecting said first and secondary frames and operable to pivot said three-point connectors and attached implement relative to said framework between (a) an operative position wherein the implement is held in an operative ground engaging condition for movement behind the draft vehicle and (b) an inoperative position wherein the implement is lifted from the ground and is supported directly by said adapter assembly;

wherein said jack means includes a hydraulic cylinder connected at one end to the first framework;

a lever arm pivotably mounted to the first framework and connected to the remaining end of said cylinder for pivotal movement in response thereto; and

a connecting beam pivotably mounted at one end to said lever arm with a remaining beam end pivotably mounted to said secondary framework at a pivot point spaced from said horizontal pivot axis.

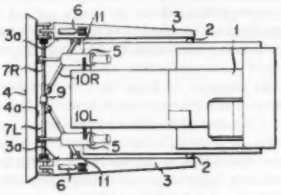
3,974,881

BULLDOZER BLADE MOUNTING

Akio Terai; Michiya Tanaka; Yasuhiro Todorobaru, and Tuneo Sugihira, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 9, 1975, Ser. No. 584,973
Claims priority, application Japan, June 7, 1974, 49-63911; June 7, 1974, 49-63912
Int. Cl.² E02F *3/76*
U.S. Cl. 172—803 **3 Claims**

1. In a bulldozer blade mounting including two push arms vertically swingably mounted at their proximal ends to the opposite sides of a tractor and extending forwardly, a bulldozer blade connected to the distal ends of said arms, a tilt brace extending between the top of each arm and the upper side of the back of said blade for the tilting of the blade around the longitudinal axis of said tractor, and a pair of diagonal braces each swingably connected at its proximal end around an axis parallel to the longitudinal axis of the respective arm



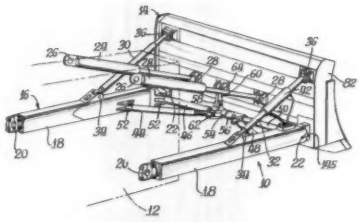
on the inside of the respective arm and extending inwardly toward each other so as to be connected to each other at the distal ends thereof, the improvement wherein said pair of diagonal braces are connected to each other at their distal ends by a universally pivotable means and the location of said universally pivotable means is so selected that it lies at a level higher than the plane including the swingable connection of said proximal ends of said diagonal braces to said arms.

3,974,882

CELLULAR BULLDOZER BLADE WITH BUILT-IN SUPPORT BRACKETS

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 26, 1975, Ser. No. 635,509
Int. Cl.² E02F *3/76*
U.S. Cl. 172—803 **14 Claims**



1. A cellular bulldozer blade, adapted to be carried by a plurality of support members, comprising;

transversely extending moldboard means including a front face for carrying earth or the like and a rear face;

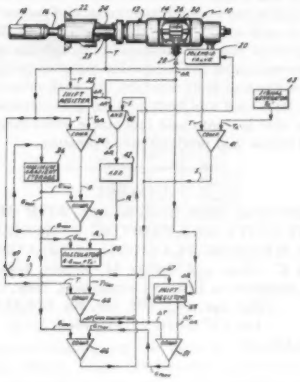
plate means secured to said rear face of said moldboard means for cellular reinforcement thereof and defining a bracket receiving recess therein; and

a bracket including a body portion having a forwardly facing surface and a rearwardly facing surface thereon which is disposed in closing relation to said recess and peripherally weldably secured to said plate means, bearing means secured to said rearwardly facing surface of said body portion for load transferring connection to one of the support members of the blade, and an elongatably penetrating internal web extending forwardly from said forwardly facing surface of said body portion for vertically stiffening the bracket and the cellular construction of said plate means.

3,974,883
TIGHTENING SYSTEM

Jerry A. Sigmund, Willow Grove, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 19, 1975, Ser. No. 579,112
Int. Cl.² B23Q *5/08*
U.S. Cl. 173—12 **51 Claims**



1. A tightening system for tightening a fastener system until a yield point has been detected, said tightening system comprising:

wrench means for applying torque and imparting rotation to a fastener;

measuring means associated with said wrench means for developing a signal representative of the torque being applied to the fastener and for developing a signal representative of the rotation of the fastener;

gradient calculating means responsive to said torque and rotation signals for developing a gradient signal representative of the slope of a Torque-Rotation curve which could be plotted for the fastener being tightened;

calculator means for developing a signal representative of a theroetical curve having a predetermined relationship with said Torque-Rotation curve; and

control means responsive to said theoretical curve signal and one of said other signals for developing and a control signal when theoretical curve signal and one of said other signals have a predetermined relationship representative of the yield point of the fastener system.

3,974,884
POWER WRENCH WITH MAGNETIC SLEEVES FOR VARIABLE TORQUE OUTPUT

Lennart Erik Idoft Gidlund, Tullinge, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed June 25, 1974, Ser. No. 482,832
Claims priority, application Sweden, July 2, 1973, 7392694
Int. Cl.² F16D *27/01*; B25B *21/02*, *23/142*
U.S. Cl. 173—12 **4 Claims**

1. A power wrench having a variable torque output, comprising:

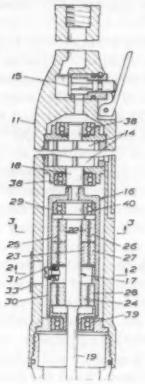
a motor;

an output shaft;

reduction gear means and a magnetic clutch means rotatably coupling said motor to said output shaft, said magnetic clutch means being arranged to release the output shaft from the motor when the torque transmitted therethrough reaches a predetermined value, said magnetic clutch means comprising:

a driven shaft having a permanent-magnetic sleeve affixed thereon; and

a driving sleeve means comprising two intercoupled sleeves each having a permanent-magnetic sleeve affixed therein, said driving sleeve means having a predetermined radial clearance to the magnetic sleeve on the driven shaft, said permanent-magnetic sleeves being radially magnetized so that their annular surfaces toward said clearance form a plurality of axially extended and circumferentially distributed pole surfaces;

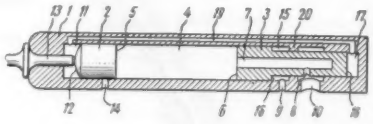


said two intercoupled sleeves of said driving sleeve means being turnable relative to each other and interlockable in preselected relative angular positions so that the pole surfaces of the permanent-magnetic sleeves of said two sleeves of said driving sleeve means coact or counteract in selective amounts in their magnetic couplings to said permanent-magnetic sleeve of said driven clutch member to thereby vary the torque output of the power wrench.

3,974,885
PNEUMATIC PERCUSSIVE POWER TOOL

Boris Vasilievich Sudnishnikov, Krasny prospekt, 56, kv. 59; Konstantin Konstantinovich Tupitsyn, ulitsa Krylova, 3, kv. 37; Sergei Konstantinovich Tupitsyn, ulitsa Zorge, 123, kv. 31, and Mikhailovich Makarov, ulitsa Kamenskaya, 84, kv. 45, all of Novosibirsk, U.S.S.R.

Continuation of Ser. No. 270,164, July 10, 1972, abandoned. This application Nov. 12, 1974, Ser. No. 523,159
Int. Cl.² B25D *9/04*
U.S. Cl. 173—121 **10 Claims**



1. A pneumatic percussive power tool, comprising: a housing (1) having an inner cylindrical cavity accommodating a working tool (13) in the head portion thereof; a dynamically-balanced percussive mechanism located in said cavity of the housing and including a hammer (2) and a two-step balancing piston valve (3) disposed so that the length of its stroke can be adjusted automatically, said hammer and said piston valve reciprocating under the action of compressed air so that at the end of forward strokes the hammer (2) delivers blows on the tool (13) for acting on an object being treated, said hammer (2) and said balancing piston valve (3) dividing the inner cylindrical cavity of the housing into a head chamber (11), defined by the working tool (13), the housing and the hammer (2); a central chamber (4), defined by the end face of the

hammer (2) facing in the direction away from the tool, the housing and the end face of a larger step of the balancing piston valve (3), facing toward the tool; a rear chamber (15), defined by the end face of the larger step of the piston valve (3) facing in the direction away from the tool, the walls of the housing and the side surface of a smaller step of the piston valve (3); and a supplementary chamber (17), defined by the walls of the housing (1) and the end face of the smaller step of the piston valve (3) facing in the direction away from the tool; a longitudinal passage (7) provided in the balancing piston valve (3)

and communicating permanently with the central chamber (4); a radial port (8) in said piston valve (3) and communicating permanently said longitudinal passage (7) with the side surface of the smaller step of the piston valve (3); another port (9) in the rear part of the housing (1) and communicating permanently the rear chamber (15) for connection to a compressed air source; a further port (10) in the rear part of the housing (1), communicating permanently with the atmosphere; a passage (19) in the housing (1) communicating permanently the head chamber (11) and the supplementary chamber (17); a port (14) provided in the front part of the housing (1) for communicating the head chamber (11) with the atmosphere when the hammer (2) is so disposed relative to the housing (1) that said further port (14) is not closed by the hammer (2); the central chamber (4) communicating with the compressed air source, when the balancing piston valve (3) is so disposed relative to the housing (1) that said radial port (8) of the piston valve (3) is aligned with the rear chamber (15), said central chamber (4) communicating with the atmosphere when said piston valve (3) is so disposed relative to the housing (1) so that said radial port (8) of the piston valve (3) is aligned with said another port (10) of the housing (1) communicating with the atmosphere.

3,974,886
DIRECTIONAL DRILLING TOOL

Jack L. Blake, Jr., Eastman-Whipstock, Box 567, Dubai, United Arab Emirates

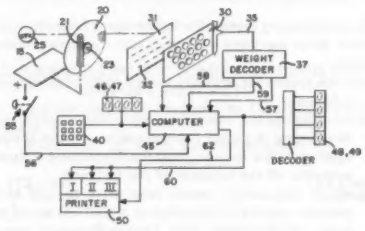
Filed Feb. 27, 1975, Ser. No. 553,506
Int. Cl.[2] E21B *7/06, 9/26*
U.S. Cl. 175—76 **14 Claims**

1. A directional drilling tool adapted for use on a fluid conductive drill string having a remote end mounting a drill bit and an opposite upper end portion, the tool comprising a tool body, having an internal receptacle at a predetermined position, adapted to be mounted on the drill string in substantially coaxial alignment therewith spaced from the drill bit in the direction of the upper portion of the drill string; a work member mounted on the tool body for selected movement laterally of said tool body for engagment with the wall of a borehole within which the drill string is received; a fluid conductive reciprocal member mounted within said tool body for movement substantially axially thereof and having an exterior cam surface in engagement with the work member internally of the tool body and a seat at the end thereof remote from the drill bit adjacent to the internal receptacle; and means for selective receipt in said seat in obstructing relation to fluid under a predetermined pressure conducted through the drill string to cause movement of the reciprocal member toward said drill bit within the tool body whereby the work member is moved laterally from said tool body and for gravitational movement from the seat and into said receptacle when fluid pressure is reduced below said predetermined pressure.

3,974,887
COMPUTING WEIGHING SCALE WITH OPTIONAL SALE BY UNIT LABEL PRINTING WITH NO GOODS ON THE WEIGHING PLATFORM AS PRECONDITION

Kenneth C. Allen, and Robert M. Rogers, both of Dayton, Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 14, 1975, Ser. No. 568,033
Int. Cl.[2] G01G *23/38;* **G06F** *15/20*
U.S. Cl. 177—4 **6 Claims**



1. In a computing scale including a weighing device, a computer having means for accepting price per unit weight and a weight input from said weighing device, said computer being operable to multiply weight and price per unit weight information and to produce a value output, a printer connected to said computer and controlled thereby to produce a printed record of at least the value, and a manual control for actuating said printer;

the improvement comprising means providing an output signal from said scale indicating no load on said scale, and a value only control responsive to the coexistence of a no load signal and operation of said manual control and connected to said printer to cause said printer to produce as a value record an amount entered as price per unit weight.

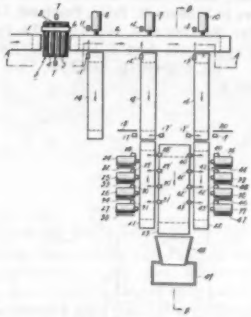
3,974,888
METHOD OF WEIGHING AND APPARATUS THEREFOR

Katsuhiko Murakami; Tetsuo Ikeda; Masahiro Takeda; Osamu Kazama, and Hidaka Nishinaka, all of Kyoto, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusyo, Kyoto, Japan

Filed Aug. 30, 1974, Ser. No. 502,218
Claims priority, application Japan, Sept. 1, 1973, 48-98714
Int. Cl.[2] G01G *13/00, 19/52;* **B07B** *13/08*
U.S. Cl. 177—52 **6 Claims**

1. A method of automatically weighing a plurality of articles having varying weights to produce a collection of said articles meeting a predetermined total weight of a group of the articles comprising weighing each of the articles in a single weighing

zone; storing the weight value of each article in a memory unit; passing the weighed articles to a classifying and separating zone to transfer the weighed articles one at a time into either a discard section, an allowable plus section, or an allowable minus section, said passing depending upon the stored weight value for each article; passing each article from each of said allowable plus section and said allowable minus section into a first discharge section and a second discharge section



respectively; determining, on the basis of the stored weight value of each article, which combination of weighed articles in said first discharge section and said second discharge section meets the predetermined total weight value selected; passing the selected combination of weighed articles to meet the total weight value to an accumulation zone, and removing the weight value of each article selected for passage to the accumulation zone from the memory unit.

3,974,889

AXLE WEIGHING OF ROAD VEHICLES

Frank Herbert May, London, and William Wilfred Marshall, Worcester, both of England, assignors to Saunders Transport Limited, London, England

Filed Oct. 17, 1974, Ser. No. 515,460

Claims priority, application United Kingdom, Nov. 2, 1973, 51081/73

Int. Cl.² G01G *19/02, 23/18*

U.S. Cl. 177—134 **8 Claims**

1. In combination a wheel cleaner and axle weigher for trucks, comprising:

a base frame installed at ground level in position for a truck to be driven in a longitudinal direction over said frame and including longitudinally-extending structural members along its sides;

wheel cleaner means comprising at least one pair of longitudinally spaced rollers mounted on said base frame between said structural members for rotation about respective parallel horizontal axes, said rollers being positioned to permit truck wheels on a common truck axle to be spun thereon to throw dirt off said wheels by centrifugal action;

a weigh beam having bearing pins projecting at its ends;

support means including load cells mounted on said longitudinally-extending structural members of said base frame at only one end of said base frame at a level above the weigh beam for supporting said weigh beam pendulously at its ends in a position transversely across said base frame, said support means including bearing assemblies mounted under and carried by said load cells and receiving said bearing pins on the ends of said weigh beam, which bearing assemblies are of a type permitting a degree of universal movement so that the weigh beam can tip and tilt to a limited extent;

block members mounted on said base frame to limit the extent of movement of the suppored ends of said weigh beam;

wherein said load cells include electrical transducer means for providing direct electrical output signals representative of the load supported by said weigh beam; and

signal combining means responsive to the individual output signals from said load cells to provide a further signal representative of axle weight.

3,974,890

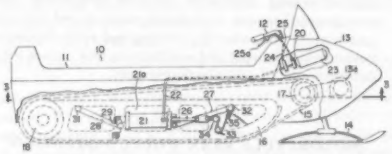
SNOWMOBILE SUSPENSION

James Noble, P.O. Box 2532, Idaho Falls, Idaho 83401

Filed May 8, 1975, Ser. No. 575,497

Int. Cl.² B62D *57/02*

U.S. Cl. 180—5 R **13 Claims**



1. A snowmobile having improved turning capability comprising:

a. a snowmobile frame having a power plant, drive sprocket and ski guide means attached thereto;

b. a track frame suspended from said snowmobile frame;

c. an endless track encircling said drive sprocket and said track frame;

d. driver operable tilt means to tilt said track frame to remove the forward part of the track beneath said track frame from contact with the terrain while said snowmobile is in motion; and

e. throttle-independent actuator means to actuate said tilt means.

3,974,891

CRAWLER VEHICLE

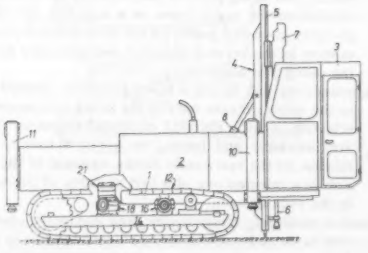
Jan Edvard Persson, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jan. 21, 1975, Ser. No. 542,807

Claims priority, application Sweden, Jan. 25, 1974, 7400960

Int. Cl.² B62D *11/00*

U.S. Cl. 180—9.44 **62 Claims**



1. A crawler vehicle comprising:

a main frame;

two substantially parallel crawler assemblies with respective frames; and

means for pivotally mounting the crawler assembly frames to the main frame, said crawler assembly frames being pivotable relative to each other about axes transverse to the crawler frames;

said pivotal mounting means including respective journal bearing devices connecting the main frame with each of the crawler frames, each of said journal bearing devices comprising a journal, a bearing box receiving the journal therein and an elastic element mounted between the journal and the bearing box to prevent direct contact between the journal and the bearing box, at least one of said journal and bearing box having at least one axially directed abutment extending therefrom, and said bearing box and journal each having at least two axially spaced abutment shoulders, said elastic element being pre-compressed between said journal and said bearing box and between said abutment shoulders so as to abut against said at least one axially directed abutment and against said abutment shoulders, thereby preventing sliding movements between said elastic element and said journal and bearing box, whereby turning and axial displacement between said journal and said bearing box causes shearing deformations of said elastic element.

3,974,892

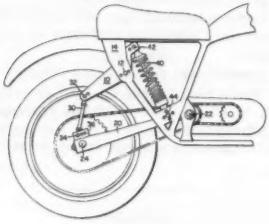
MOTORCYCLE REAR WHEEL SUSPENSION

Joseph E. Bolger, Summer St., Barre, Mass. 01005

Filed May 12, 1975, Ser. No. 576,790

Int. Cl.² B62K *25/02*

U.S. Cl. 180—32 **1 Claim**



1. In a motorcycle including a front wheel and a driving rear wheel and an engine supporting main frame and a rear wheel swing arm assembly pivoted at its forward extremity to the main frame, the improvement in a rear wheel suspension system for selectively controlling the stresses inherent in contact between the driving wheel and ground during operation over rough terrain comprising:

a rocking arm having forwardly and rearwardly facing terminals and being pivoted intermediate its terminals and relative to the main frame in a selected one of a first plurality of pivotal points on the main frame for a rocking motion in the vertical plane of and generally parallel to the swing arm assembly,

a connecting link having a lower extremity pivoted relative to the rearward extremity of the swing arm assembly in a selected one of a plurality of pivotal points on the swing arm assembly and having an upper extremity pivoted relative to the rearwardly facing terminal of the rocking arm in a selected one of a first plurality of pivotal points in the rocking arm,

and a resiliently compressible and dampened suspension unit having a lower extremity pivoted relative to the main frame rearwardly of the pivotal interconnection of swing arm assembly and main frame in a selected one of a second plurality of pivotal points on the main frame and having an upper extremity pivoted relative to the forwardly facing terminal of the rocking arm in a selected one of a second plurality of pivotal points on the rocking arm.

3,974,893

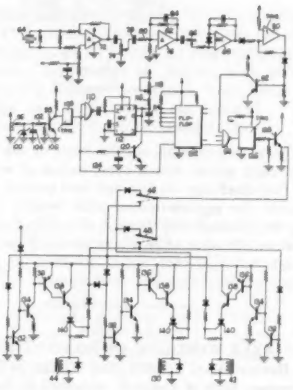
METHOD AND APPARATUS FOR SENSING AND CONTROLLING MOTION OF A MOVABLE MEMBER

Charles C. Conner, and William R. Price, both of Portland, Oreg., assignors to William R. Price, Portland, Oreg.

Division of Ser. No. 380,679, July 19, 1973, Pat. No. 3,891,932. This application June 2, 1975, Ser. No. 582,893

Int. Cl.² G05D *13/62*

U.S. Cl. 180—105 E **6 Claims**



1. Apparatus for sensing a predetermined motion of a vehicle having an electrically operated transmission for controlling the motion of the vehicle, the apparatus comprising:

a. a transducer capable of converting noise signals to electric alternating current signals,

b. means mounting the transducer for engagement with a wheel of the vehicle,

c. electric direct current motion signal generating means having an input connected to the output of the transducer and operable by the alternating current output signals of the transducer to produce direct current motion signals proportional to the magnitude of motion of the vehicle,

d. electric direct current signal generating means for producing direct current control signals representing a predetermined motion condition of the vehicle,

e. electric sensing signal generating means having an input connected to the outputs of the direct current motion and control signal generating means and capable of producing a constant electric output sensing signal when the motion and control signals are matched, the magnitude of the output sensing signal being independent of the difference between the motion and the control signals, and

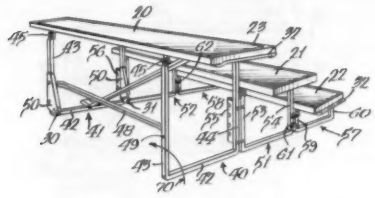
f. electrical sensing means connected to the output of the electric sensing signal generating means for actuation by the electric output sensing signal, the sensing means including electric solenoid means connected to the transmission and operable by the electric output sensing signal to effect shifting of the transmission.

3,974,894

PORTABLE RISER

Jerry A. Wenger, Owatonna; Harvey M. Urch, West Concord, and David R. Boeddeker, Owatonna, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.

Filed Aug. 18, 1975, Ser. No. 605,770
Int. Cl.² E04H 3/12
U.S. Cl. 182—113 18 Claims



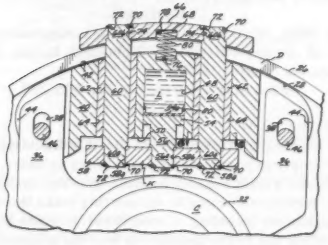
1. A portable riser having a plurality of steps of increasing elevation rearwardly of the riser, a pair of floor-engaging sliders hinged to the underside of each step for pivotal movement about parallel axes transverse to the length of a step whereby said steps may be moved from a travel position adjacent and parallel to said sliders to an erected position normal to said sliders, hinge means interconnecting sliders of adjacent steps for pivotal movement about axes lengthwise of the height of said sliders whereby said steps may fold relative to each other when said sliders are in said travel position, said hinge means including first hinges interconnecting the uppermost step and an intermediate step for movement between a superimposed facing relation when in a travel position and a side-by-side position and second hinge means connecting said intermediate step and lowermost step for movement between a superimposed back-to-back relation in a travel position and a side-by-side position, and automatically engageable latch means interconnecting a step and one of said associated pair of sliders to hold said riser in erected position.

3,974,895

EMERGENCY BRAKE UNIT

Patrick N. Murphy, 3505 Chester Ave., Bakersfield, Calif. 93301

Filed Mar. 10, 1975, Ser. No. 556,658
Int. Cl.² F16D 53/00
U.S. Cl. 188—76 4 Claims



1. In combination with an axle of an automotive freight vehicle that rotatably supports a pair of pneumatic-tired wheels on the ends thereof, which wheels have open brake drums secured thereto that extend inwardly towards one another, each of which drums include an external and internal cylindrical surface, said brake drums each having two pivotally supported brake shoes therein that have first ends thereof spaced from one another, power means for pivoting said brake shoes in said brake drums to braking positions, a pair of emergency brake units for braking said pneumatic-tired wheels by hydraulic fluid under pressure from a source thereof independent of said power means, each of said emergency brake units including:

clamp means that grip said axle adjacent one of said brake drums;

a pair of spaced arms supported from said clamp means;

an arcuate first brake shoe that has a portion thereof disposed adjacent said external surface of said brake drum;

a yoke that includes a cross piece and two rigid members that extend therefrom, said members supporting said first brake shoe from the free ends thereof;

a rigid body movably supported from said arms for longitudinal movement relative thereto, said body including a second arcuate brake shoe that is disposed adjacent said internal surface in the space between said first ends of said pivotally supported brake shoes, said body slidably supporting said members of said yoke said body having a cavity therein that serves as a hydraulic cylinder;

compressed spring means disposed between said first brake shoe and body that at all times tend to maintain said first and second brake shoes in a first spaced relationship wherein said first and second brake shoes are out of contact with said brake drum;

conduit means for discharging hydraulic fluid under pressure into and out of said cavity;

a piston slidably and sealingly mounted in said cavity; and

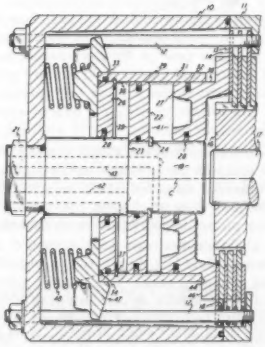
a piston rod extending from said piston to said yoke, with said hydraulic fluid as it discharges into said cavity first moving said first brake shoe towards said body to dispose said first brake shoe in pressure frictional contact with said external surface of said brake drum, and said hydraulic fluid as it continues to discharge into said cavity moving said body away from said axle to dispose said second brake shoe in pressure frictional contact with said internal surface of said drum.

3,974,896

FAIL-SAFE BRAKE FOR A VEHICLE

David T. Rach, Milan, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed July 21, 1975, Ser. No. 597,421
Int. Cl.² F16D 65/24
U.S. Cl. 188—170 10 Claims



1. A fail-safe brake for a vehicle having an actuator means and friction-type brake members operative to effect brake action in response to said actuator means applying a force thereon, said actuator means comprising a shaft pilot member, a projection coaxially on said pilot member, a piston member fluid-tightly slidable coaxially about said pilot member for

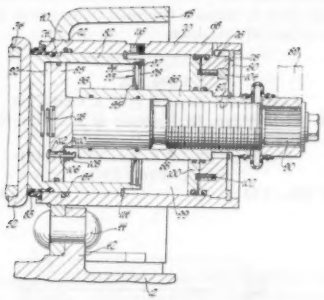
movement toward and away from said projection, a cylindrical member affixed to said piston member and extending therefrom and in fluid-tight sliding relation over said projection and defining a fluid-retaining pocket with said projection and said piston member and being operatively associated with said brake members for forcing said brake members into braking action in response to movement of said piston member toward said projection, a fluid pressure pump and passageway in fluid-flow communication with said pocket for fluid pressurizing said piston member in the direction away from said projection to thereby relieve the braking force on said brake members, spring means operatively associated with said piston member for yieldingly moving said piston member toward said projection when the fluid pressure in said pocket is only a minimum pressure and to thereby effect a fail-safe brake action on said brake members, and an additional member being coaxially slidable on said pilot member and operatively associated with said brake members for effecting brake action in response to selective actuation of said additional member independent of movement of said piston member.

3,974,897

BRAKE ACTUATOR ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1975, Ser. No. 567,126
Int. Cl.² F16D 65/74
U.S. Cl. 188—196 A **14 Claims**



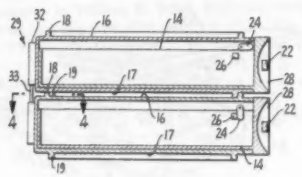
1. A self-contained brake actuator assembly comprising: a cylinder, an actuated piston within said cylinder, an actuating piston, a rotatable threaded shaft member for translating rotational motion to axial motion operatively connected to said actuating piston, means for rotating said shaft member, a fluid-filled chamber between said actuated and actuating pistons defining a fluid link therebetween whereby axial movement of said actuating piston causes axial movement of said actuated piston, wear take-up and anti-drag means for permitting substantially free forward movement of said actuated piston in unison with said actuating piston and for limiting retraction of said actuated piston to a predetermined maximum distance, and fluid supply means contained solely within said cylinder and acting as the only source for supplying additional fluid to said chamber in response to retraction of said actuating piston a distance greater than the predetermined maximum for said actuated piston to thereby accommodate the increase in volume of said chamber occasioned by the resultant separation of said pistons, said shaft member being the only input for actuating said assembly.

3,974,898

CONVERTIBLE SUITCASE

Kay Jeanne Tullis, 191A Throckmorton, Mill Valley, and Robert Stanley Krolick, P. O. Box 3557, Daly City, both of Calif. 94941

Filed May 23, 1975, Ser. No. 580,476
Int. Cl.² A47B 61/06
U.S. Cl. 190—3 **2 Claims**



1. A combination suitcase and chest-of-drawers, comprising a plurality of stackable and hand-portable suitcase units, each suitcase unit comprising

an outer envelope member,

an inner drawer member slidably mounted in said envelope member, and

said envelope member having two generally planar parallel sides thereto, the outer surfaces of said sides having interlockable bead portions thereon formed to upstand therefrom and dimensioned so as to engage the corresponding interlockable portions on the confronting face of a second suitcase unit brought into juxtaposition therewith and to impede relative movement of the two suitcase units with respect to each other in the plane of said planar parallel sides,

each of said envelope members further comprising a retaining latch mechanism borne on the rearward side of said envelope member, said latch mechanism comprising a channel member fixed to said envelope member and formed with a channel therein oriented generally perpendicular to said planar parallel sides and generally parallel to said rearward side, and a bolt member slidably mounted in said channel member and selectively partially engageable with a corresponding channel member on an envelope member placed adjacent thereto while retaining partial engagement with said first-named channel member, to restrain relative movement between said envelope members.

3,974,899

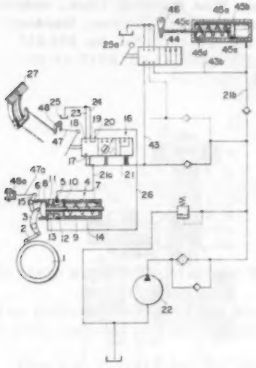
STEERING BRAKE SYSTEM FOR USE IN TRACK-TYPE VEHICLES

Masazo Mita, Hirakata, and Masatsugu Nagatomo, Katano, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 7, 1975, Ser. No. 575,227
Int. Cl.² B60K 41/20
U.S. Cl. 192—3 M **3 Claims**

1. A steering brake system for use in a track-type vehicle which comprises a steering brake, a brake cylinder, an emergency brake piston slidably inserted into the brake cylinder and operatively connected to the steering brake through a first link mechanism including a brake lever, a spring means provided within the brake cylinder to bias the emergency brake piston toward its braking position, a hydraulic pressure receiving chamber defined by and between the brake cylinder and the emergency brake piston and connected to a hydraulic fluid supply circuit to maintain the emergency brake piston in its non-braking position against the action of the spring means in case of the normal condition of the vehicle, a brake pedal, a drain connected to the hydraulic fluid supply circuit through a first drain circuit including a variable pressure reducing valve for controlling hydraulic pressure within the hydraulic pressure receiving chamber in the brake cylinder and the

hydraulic fluid supply circuit in response to a degree of depression of a brake pedal, said brake pedal being connected to said variable pressure reducing valve through a second link mechanism, said valve having drain ports each connected to the first drain circuit to drain away therefrom hydraulic fluid in case of emergency of the vehicle, and an auxiliary lever



having one end adapted to contact the brake lever when the emergency brake is operated and the other end connected to the brake pedal through an auxiliary link mechanism, wherein the emergency brake can be released by urging the emergency brake piston toward its non-braking position against the action of the spring means by the depression of the brake pedal without using any hydraulic pressure.

3,974,900

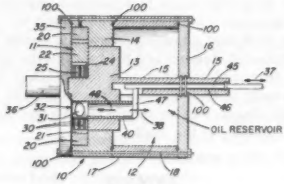
ROTARY DISPLACEMENT COUPLING DEVICE

DeMoss Park, P.O. Box 901, Ponca City, Okla. 74601

Continuation-in-part of Ser. No. 490,050, July 19, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,571

Int. Cl.² F16D *31/04, 31/08*

U.S. Cl. 192—61 **8 Claims**



1. A rotary displacement mechanical coupling device comprising:

a. a casing means containing a first chamber enclosing each end;

b. a fluid reservoir means;

c. a hub rotatably mounted through one of said partitions;

d. a plurality of outer gear teeth circumferentially spaced around the periphery of said first chamber;

e. a crescent means attached to said hub means in said first chamber and having a radius substantially identical with the inner radius of said outer gear teeth;

f. a pinion gear having teeth on its periphery and having a radius less than the inner radius of said outer gear teeth;

g. means for journaling said pinion gear to said hub so that said pinion gear teeth engage at least a portion of said outer gear teeth;

h. a first fluid communication means passing radially through substantially all of said pinion teeth;

i. a second fluid communication means passing from the outside of said means for journaling through said hub and to said fluid reservoir means; and,

j. means in said second fluid communication means to selectively control the flow of fluids through said second communication means and into said fluid reservoir means.

3,974,901

FLUID OPERATOR FOR RELEASING AND RAPIDLY ENGAGING A CLUTCH

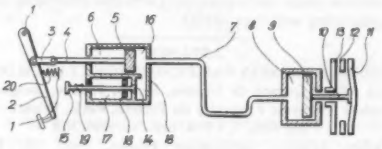
Jaroslav Cervinka; Oldrich Hofman, both of Divisov, and Pavel Husak, Prague, all of Czechoslovakia, assignors to JAWA, narodni podnik, Tynec nad Sazavou, Czechoslovakia

Continuation of Ser. No. 458,121, April 5, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,214

Claims priority, application Czechoslovakia, Apr. 16, 1973, 2709-73

Int. Cl.² F16D *25/00*

U.S. Cl. 192—83 **9 Claims**



1. In an apparatus for operating a friction clutch of the type having lifter means operable, upon the application of force thereto, to effect the disengagement of a pair of clutch elements which are normally biased into frictional contact, operator foot control lever means, and means coupling the foot control lever means to the lifter means for the application of clutch disengaging force to said lifter means, and wherein said control lever means is movable in a given direction from a first position at which no force is applied to said lifter means by way of said coupling means to disengage said clutch elements to a second position at which force is applied to said lifter means by way of said coupling means to disengage said clutch means; the improvement wherein said coupling means comprises means responsive to movement of said foot control lever means in said direction to said second position for applying clutch disengaging force to said lifter means, and quick release control means coupled to said coupling means for rapidly releasing force applied to said lifter means by said foot control lever means, said control means comprising operator controlled button means movable to control the force transmitting characteristics of said coupling means between said lever means and said lifter means; said operator controlled button means being movable in said direction to control said force transmitting characteristics, and said button means being positioned to be engaged by said foot control lever means for movement in said direction.

3,974,902

MAGNETIC SPRING GRIP DEVICE

Robert L. Wahlstedt, Roseville; Robert F. Rasmussen, Minneapolis, and Lee W. Johnson, Lake Elmo, all of Minn., assignors to Reel Precision Maufacturing Corporation, St. Paul, Mich.

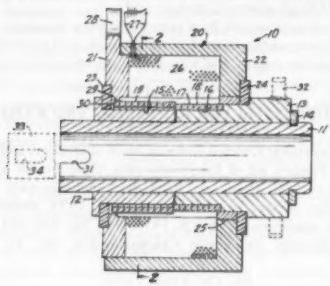
Continuation-in-part of Ser. No. 531,250, Dec. 9, 1974, abandoned. This application June 26, 1975, Ser. No. 590,401

Int. Cl.² F16D *27/10*

U.S. Cl. 192—84 T **8 Claims**

1. A magnetic spring grip device comprising a drum or hub, a helical spring loosely engageably coiled about said drum and having a free end coil, said drum and spring being relatively

rotatable, and an annular pole piece, fixed with respect to said drum and spring, closely adjacent said free end coil and defining, with said drum and coil, a magnetic path wherein mag-



netic lines of flux pass from said drum to said coil and directly to said pole piece; and a selectively actuable generating means for generating said lines of flux.

3,974,903

RESILIENT TORSION DAMPENERS FOR CLUTCH DISCS

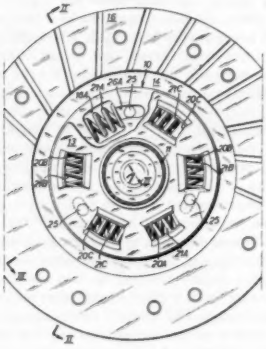
Marie Alfred Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 7, 1974, Ser. No. 440,368

Claims priority, application France, Feb. 12, 1973, 73.04805

Int. Cl.² F16D *3/14*

U.S. Cl. 192—106.2 **11 Claims**



1. A damping device coupling and allowing limited relative angular displacement of two parts, comprising a first part including a central plate with passage means, a second part including a lateral plate on each side of said central plate and pin means interconnecting said lateral plates and passing through said passage means, said passage means defining clearance in both directions of relative angular displacement of said pin means from said rest position, generally rectangular windows in said central plate substantially in registration in said rest position with generally rectangular windows in said lateral plates, said windows including a pair of opposed, generally radial sides and a pair of opposed, generally circumferential sides, resilient damping means being confined circumferentially by said windows, coupling said plates for rotation, and resisting relative angular displacement of said plates, said passage means extending circumferentially and opening onto said generally radial sides of at least some of said windows in the central plate, the path of limited angular displacement of said pin means including said passage means and a portion inside the overall configuration of each of the last-mentioned windows and within the spaced occupied by the resilient damping means in said last-mentioned windows in said rest position whereby said pin means enters into a portion of said last-mentioned windows which was occupied in said rest position by a portion of said resilient damping means.

3,974,904

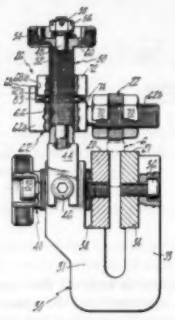
ADJUSTABLE TRACK COVER POSITIONING ASSEMBLY

Robert D. Morton, West Hartford, Conn., assignor to The Hartford Special Machinery Company, Simsbury, Conn.

Filed Feb. 27, 1975, Ser. No. 553,835

Int. Cl.² B65G *11/00*; B21D *43/16*

U.S. Cl. 193—38 **8 Claims**



1. For use in a machine having a feed track mounted on a track support secured to the machine for conveying work blanks wherein a track cover is provided for assisting in maintaining the positioning of the blanks, an adjustable assembly for selectively positioning the track cover in overlying relation to the track, the assembly comprising a track cover support bracket, a tubular adjusting screw, a stud extending through the adjusting screw and having a threaded end threadably engaged within an opening in the track support, the adjusting screw projecting through the track cover support bracket in threaded engagement therewith and being seated on the track support for selective height adjustment of the bracket and track cover supported thereon relative to the track upon rotating the adjusting screw in a selected angular direction, and snubbing means including a threaded member in threaded engagement with said adjusting screw and spring means between the threaded member and the bracket, the spring means urging the threaded member and the bracket in opposite directions axially of the adjusting screw to impede its rotation relative to the bracket and maintain the selected height of the track cover relative to the track.

3,974,905

KEY ARM MECHANISM

Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

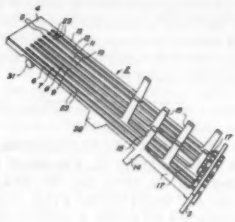
Filed Sept. 23, 1974, Ser. No. 508,484

Int. Cl.² B41J *7/92*

U.S. Cl. 197—98 **3 Claims**

1. A unitary key arm mechanism for a key actuated device comprising a support section, a plurality of key arms emanating from said support section, each of said key arms having a key support post projecting therefrom such that each key arm supports a support post, the distance of some of said support posts from said support section being greater than the distance of other of said support posts from said support section and less than the distance of still other of said support posts from said support section, the cross-sectional areas of said key arms supporting said some of said support posts being both greater than the cross-sectional areas of said key arms supporting said other of said support posts and smaller than the cross-sectional area of said key arms supporting said still other of said

support posts, said cross-sectional areas being measured for all key arms at a fixed distance from said support section and



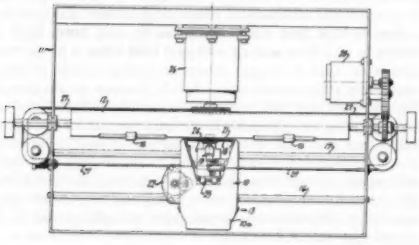
between said support section and the support post closest to said support section.

3,974,906

ENDLESS LOOP RIBBON CARTRIDGE WITH RANDOM STORAGE

Sen Lin Lee, Oakland, and Ernst Peter Hess, Castro Valley, both of Calif., assignors to Xerox Corporation, Stamford, Colo.

Filed Feb. 25, 1972, Ser. No. 229,396
Int. Cl.² B41J *33/10*
U.S. Cl. 197—168 **3 Claims**



1. A ribbon cartridge for a printer comprising:

a housing having a main body portion and first and second generally opposed spaced appendage portions extending from said main body portion, each of said first and second appendage portions having generally opposed wall portions extending from said main body portion, the distance between one of said wall portions of said first appendage portion and an opposed one of said wall portions of said second appendage portion increasing as the distance from said main body portion increases;

a principal cavity within said main body portion of said housing for storing a portion of an endless loop of ribbon in a random manner, said principal cavity having a primary ribbon exit port and a primary ribbon entrance port;

a small cavity within said first appendage portion of said housing at least partially defined by said generally opposed wall portions of said first appendage portion, said small cavity communicating with said principal cavity through said primary ribbon exit port and communicating with the exterior of said housing through a secondary ribbon exit port, said primary ribbon exit port including tensioning means for engaging a planar surface of said ribbon;

guide means forming an integral part of said first and second appendage portions for providing a path of travel for said ribbon between said first and second appendage portions in an unsupported length, said path of travel for said ribbon between said first and second appendage portions being in a plane extending between said first and second appendage portions;

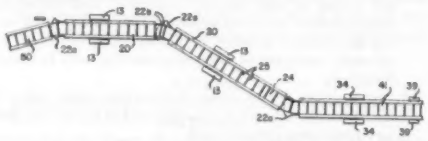
a small cavity within said second appendage portion, said small cavity within said second appendage portion communicating with said principal cavity through said primary ribbon entrance port, said primary ribbon entrance port including drive means for engaging opposite surfaces of said ribbon for advancing said ribbon along said path of travel defined by said guide means when said cartridge is operatively positioned in said printer.

3,974,907

FLEXIBLE MOBILE CONVEYOR

Howard A. Shaw, Indiana County, and John D. Todhunter, Cambria County, both of Pa., assignors to Gordon A. Brewer and Eugene F. Buell, both of Pittsburgh, Pa.

Filed Oct. 29, 1971, Ser. No. 193,802
Int. Cl.² B65G *37/00*
U.S. Cl. 198—92 **2 Claims**



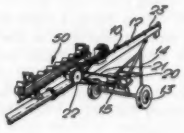
1. A flexible mobile conveyor comprising a plurality of carriages, a pair of wheels supporting each carriage, an endless conveyor mounted on each carriage, drive means on each carriage engaging and driving the conveyor means, connections between each successive carriage whereby a portion of the conveyor of one overlies and feeds to the conveyor of the next and a portion of the said one conveyor is carried by said other, said connections including a swivel connection between each pair of carriages permitting generally universal movement between adjacent carriages, a main power source on one of said carriages and connections from said main power source driving the supporting wheels in each successive carriage, each conveyor on each carriage having a ramp at one end and a flexible discharge section at the other end, said flexible discharge section including a triangular bottom plate and a pair of parallel spaced apart flexible sidewalls adjacent said triangular bottom plate moving thereover and depending means on the flexible sidewalls engaging the ramp of the next adjacent conveyor.

3,974,908

BIN SWEEPER

Albert Keichinger, Lloydminster, Sask-Alta, Canada

Continuation of Ser. No. 457,652, April 3, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,682
Claims priority, application Canada, Aug. 14, 1973, 178737
Int. Cl.² B65G *37/00*
U.S. Cl. 198—93 **6 Claims**



1. In combination

a. a grain elevator conveyor of the type having a driven auger type conveying element extending longitudinally within a casing mounted on a supporting structure adapted for adjustably positioning the angle of inclination

of the elevator conveyor, said casing having an infeed end normally supported on the ground at a position spaced from the supporting structure and an elevated outfeed end;

b. a longitudinally extending auxiliary conveyor having a conveying element, consisting of an endless belt member with cleats thereon, for receiving material along the lower surface thereof, said belt member having a series of openings meshing with the teeth of a driven sprocket and an idler supported in spaced apart relation and on which the belt conveying element runs;

c. means slidably and universally pivotally connecting one end of said auxiliary conveyor to the casing of the elevator conveyor, said auxiliary conveyor being slidable longitudinally along said casing from a first position wherein it extends from the infeed end of the casing in a direction away therefrom providing an extension to the elevator conveyor for sweeping material in the vicinity thereof toward said infeed end to a second position wherein said auxiliary conveyor is supported in piggy-back fashion on the casing of said elevator conveyor, said connecting means further including adjusting means permitting varying the relative position of the auxiliary conveyor and elevator conveyor in each of a vertical and horizontal direction;

d. power driven means mounted on said auxiliary conveyor and drivingly connected to said sprocket for driving auxiliary conveying element; and

e. remove control means for controlling the driving of said auxiliary conveying element.

3,974,909

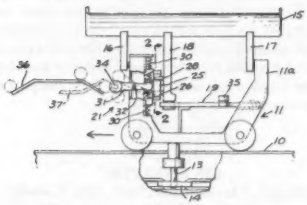
TILTING TRAY SORTING CONVEYOR

Richard B. Johnson, Mount Airy, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Aug. 22, 1975, Ser. No. 606,935

Int. Cl.² B65G *15/00*

U.S. Cl. 198—155 **8 Claims**



5. For use in a tilting tray sorting conveyor,

a carrier adapted to move along a track,

said carrier having a tray pivotally mounted thereon about a longitudinal axis,

said tray having a tilting yoke fixed thereto and adapted to engage first cam means along a track for engaging said tilting yoke and moving said yoke in one direction to tilt said tray to one side and pivot said yoke in the other direction to tilt said tray to the opposite side of said track,

and latch means operable to hold said tray in normal upright position or to permit said tray to be tilted to one side or the other of said track,

said carrier comprising a carriage, said latch means comprising

an escapement member mounted for generally vertical movement on said carriage and adapted to be moved by cam means along a track,

means yieldingly urging said escapement member to a neutral position corresponding to the upright position of said tray,

and interengaging means between said escapement member and said tray such that when said escapement member is in neutral position, said tray is maintained in upright position, when said escapement member is moved in one direction, said tray is permitted to tilt to one side of the track, and when said escapement member is moved in the other direction from neutral, the tray is permitted to tilt to the opposite side of the track.

3,974,910

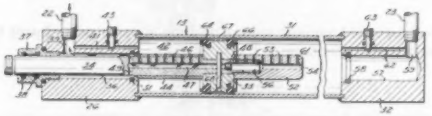
FLUID CYLINDER DECELERATING MEANS

Imre F. Papai, 2818 E. 119th St., Cleveland, Ohio 44120

Filed Feb. 28, 1975, Ser. No. 554,313

Int. Cl.² B65G *23/00*; **F15B** *15/22*

U.S. Cl. 198—203 **5 Claims**



5. A fluid actuator comprising a cylinder having first and second cylinder heads, a piston reciprocable between said heads, a piston rod connected to said piston extending through said first head, a piston rod seal on said head sealing with said piston rod, said cylinder and piston cooperating to define a first chamber the volume of which is changed by reciprocation of said piston, a land projecting from said piston along said piston rod, said first head providing a first bore proportioned to receive said land as said piston approaches said first head, a port in said first head connected to said bore, land seal means in said head sealing with said land when it projects into said bore, said land seal means including a pair of spaced oppositely acting unidirectional seals, passage means connecting said port and said bore between said unidirectional seals and including an adjustable flow restriction, and orifice means associated with said land providing a flow restriction as said piston approaches said first head to decelerate said piston, adjustment of said flow restriction adjusting the acceleration of said piston as it moves away from said first head without materially affecting the deceleration of said piston as said piston approaches said head.

3,974,911

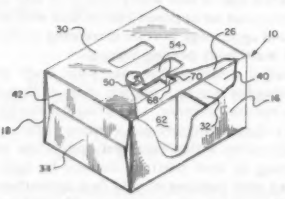
CARRIER WITH DROP DOWN PARTITION

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Sept. 30, 1974, Ser. No. 510,681

Int. Cl.² B65D *5/48*

U.S. Cl. 206—141 **9 Claims**



1. A carrier for a plurality of fragile articles comprising

a bottom panel;

a pair of opposite side panels;

a pair of opposite end closing means;

first and second overlapping top panels;

said bottom panel, said pair of opposite side panels, said pair of opposite end closing means, and said first and second overlapping top panels being interconnected in a collapsed flat condition wherein said overlapping top

panels are on top and wherein said bottom panel is on bottom;

the inside top panel of said first and second overlapping top panels having a partition and hinge formed therein free of the bottom panel, the pair of side panels and the end closing means; and

said hinge joining the partition to the inside top panel and being such that, when the carrier is opened from the flat condition, the partition freely drops into a position extending sufficiently vertically to form separated portions within the carrier for receiving fragile articles in the separated portions.

3,974,912

PACKAGING USING A SHEATH FOLDED ONTO A MANDREL

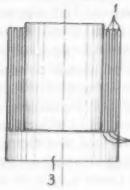
Marcel Buisson, 3, Place des Halles, 28000 Chartres, France

Continuation-in-part of Ser. No. 334,886, Feb. 22, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 535,029

Claims priority, application France, Feb. 24, 1972, 72.06211

Int. Cl.² B65D *85/02*

U.S. Cl. 206—303 **5 Claims**



1. A packaging material comprising a flexible tubular sheath adapted to be cut into independent package units of given length, said sheath having opposite open ends and being folded onto itself at one of said ends with alternating opposite annular folds to form a plurality of concentric annular plies superposed on one another in a direction perpendicular to the axis of the sheath, said plies being independently withdrawable in succession axially of said sheath and all having substantially the same length equal to that corresponding to one said package unit.

3,974,913

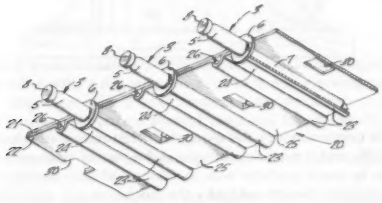
BLIND RIVET MAGAZINE

Richard F. Hirsch, 708 W. 38th St., San Pedro, Calif. 90731

Continuation-in-part of Ser. No. 491,929, July 25, 1974, Pat. No. 3,886,783. This application Apr. 3, 1975, Ser. No. 564,704

Int. Cl.² B65D *83/02, 85/24*

U.S. Cl. 206—344 **10 Claims**



1. A magazine for continuously feeding blind rivets into and conducting sheared mandrels from a riveting tool, said rivets being of the type including a tubular sleeve having an annular head at one end thereof and a mandrel extending through the sleeve, the mandrel having an enlarged head adjacent the other end of the sleeve, comprising:

a first elongate sheet positioned in a substantially planar configuration; and

a second elongate sheet formed into a plurality of parallel, generally semi-cylindrical lobes spaced by planar sections, said planar sections of said second sheet being connected to one side of said first sheet, said lobes of said second sheet and the enclosing portions of said first sheet defining a plurality of spaced openings for receipt of said mandrels of said rivets, said openings being of such a size that they snugly receive said mandrels, alternate planar sections in said second sheet being longer than the remaining alternate planar sections therein, the length of the shorter alternate planar sections in said second sheet being of such a size that said sheared mandrels are loosely received between the spaced lobes on opposite sides thereof for conducting said sheared mandrels from said riveting tool, the longer alternate planar sections being long enough to permit receipt of rivets in alternate spaced openings without interference between adjacent rivets as said rivets are conducted into said riveting tool and said sheared mandrels are conducted from said riveting tool.

3,974,914

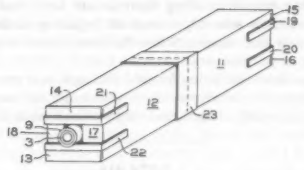
PACKAGE FOR A ROLLED CONTINUOUS SHEET MATERIAL

Christopher G. Cross, Forest City; Charles E. Kirk, Boiling Springs, and James R. Molnar, Shelby, all of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 12, 1975, Ser. No. 557,860

Int. Cl.² B65D *85/66, 81/00*

U.S. Cl. 206—408 **10 Claims**



1. In a supportive packaging apparatus for a roll of a continuous sheet of material, the combination comprising a core upon which said sheet material is wound, a tube having an outside diameter less than the inside diameter of said core, and being of greater length than said core, and of greater length than said roll of sheet material, said tube being mounted concentrically within said core, support members positioned at the opposing ends of said roll, each of said support members having an aperture therein for receiving said tube, the opposing ends of said tube extending beyond said support members, said support members having marginal portions extending beyond the periphery of said roll to provide horizontal support to said roll, means for securing said support members, said tube and said core in a unitary structure, said means for securing being attached to the portion of said tube which extends beyond said support members, a hollow covering member which is open at both ends, the length of which being less than or equal to the length of said roll of sheet material and a pair of end caps slideably engaging said hollow covering member, said end caps being hollow members with a means for a closure at one end thereof, the length of each of said end caps being less than or equal to one-half the length of said hollow covering member, said hollow covering member and said pair of end caps providing an enclosure for said unitary structure, said support members providing support to a second supportive packaging apparatus when one of said supportive packaging apparatus is stacked on a second supportive packaging apparatus.

3,974,915

BASIC FOUNDATION FOR FLORAL ARRANGEMENTS

Jack Mieuli, Jr., 6495 Camelia Drive, San Jose, Calif. 95120

Filed June 23, 1975, Ser. No. 589,451
Int. Cl.[2] B65D *85/50, 85/52, 25/24, 5/52*
U.S. Cl. 206—423 9 Claims

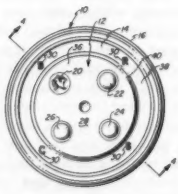
1. A foundation form for floral arrangements comprising:
a. a flat sheet of semi-rigid paper board having an isosceles triangular upper portion integral at its base line to a rectangular lower base portion of lesser dimension altitudinally than the upper portion;
b. a pair of slits formed along the base line and inwardly from the outer ends thereof a distance approximately one-third the length of the base line for dividing said rectagular base portion into a medial zone integral to said triangular upper portion and flanked by identical lateral zones severable therefrom;
c. a plurality of equally spaced crease lines formed in each of said lateral zones parallel to the altitudinal axis of said flat sheet and between said medial zone and the side edges of said rectangular base portion, said lateral zones being bendable along their crease lines and adapted to have their side edges secured together in the form of a basket-like closure below the base line of said triangular upper portion; and
d. punched out holes formed through said medial portion adapted to receive wires therethrough for securing flower stems and the like thereto within the basket-like closure.

3,974,916

VISUAL INDICATOR FOR IDENTIFYING CONTAINER CONTENTS

Edgar O. Bartolucci, Ridge Road, Tuxedo Park, N.Y. 10987

Filed May 27, 1975, Ser. No. 580,590
Int. Cl.[2] B65D *43/00, 73/00*; G01D *13/00*
U.S. Cl. 206—459 16 Claims



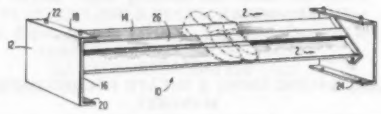
1. In a container capable of carrying a particular one of a variety of contents, a selective indicator for visually indicating the identity of the particular contents, said indicator comprising:
at least one raised portion in a visible surface of the container, said raised portion being capable of selective manual permanent deformation to alter the appearance of the portion; and
visible indicia associated with said raised portion, said indicia being related to one of the variety of contents.

3,974,917

SHOE RACK STACK

Andrew Waxmanski, 3436 Brinkley Road, Temple Hills, Md. 20031

Continuation of Ser. No. 441,846, Feb. 12, 1974, abandoned.
This application Aug. 25, 1975, Ser. No. 607,483
Int. Cl.[2] A47F *7/08*
U.S. Cl. 211—36 2 Claims



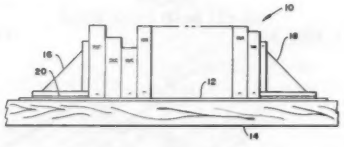
1. A shoe rack comprising:
a pair of end supports, an elongated platform disposed endwise between said end supports and inclined downwardly from one side of the shoe rack to its other side and having flange portions downwardly inclined from said one side thereof and adjacent opposite ends of said platform, means for securing the end supports to the opposite ends of said platform respectively including means carried by said end supports and engageable with said flange portions, an elongated shoulder upstanding from said inclined platform intermediate its opposite edges and substantially coextensive in length with said platform for retaining shoes on said platform, a support for said platform intermediate said end supports and comprising an element upstanding from an elevation common with the elevation of the lower edges of said end supports to an elevation for supportive engagement with said platform, and means for releasably securing the upper end portion of said element to said platform, the underside of said platform being recessed, the upper end of said element having a part receivable within said recess, said recess being substantially coextensive in length with said platform whereby said element can be located at selected positions along said platform with said part receivable in said recess at selected positions therealong.

3,974,918

MAGNETIC BOOK SUPPORTING STRUCTURE

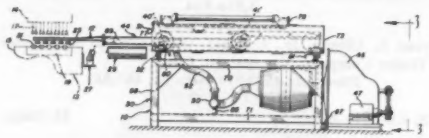
George Yaremchuk, 5138 Lonyo, Detroit, Mich. 48210

Filed Jan. 17, 1975, Ser. No. 541,739
Int. Cl.[2] A47B *65/00*
U.S. Cl. 211—43 2 Claims



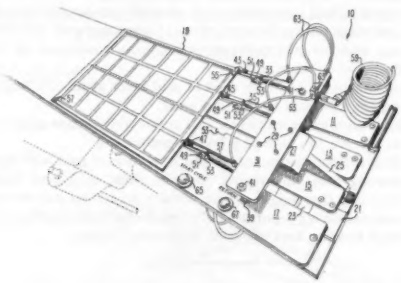
1. In combination, a flat elongated, elastomeric strip having magnetic metal particles therein, and a pair of bookends of a size to be easily portable with the elongated strip having magnets secured thereto whereby the bookends are cooperable with the elongated strip in its flat condition when placed in spaced apart locations along the strip to support bookds on the strip between the bookends against the pressure of the books in the direction of the elongation of the strip said strip being completely flexible and therefore portable and easily capable of being packaged along with the bookends.

3,974,919
PRESS UNLOADER
Janis A. Bokalders, Golf, and Rade Jurich, Oak Lawn, both of Ill., assignors to Wehr Corporation, Milwaukee, Wis.
Filed Oct. 5, 1970, Ser. No. 77,807
Int. Cl. B66c *1/02*
U.S. Cl. 214—1 BT **14 Claims**



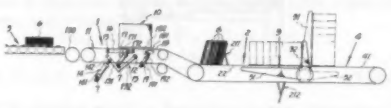
9. An unloading apparatus for an article forming machine, comprising: frame means, an unloader carriage movable in said frame means from an article seizing position to an article release position, said unloading carriage having a plurality of article seizing means carried thereby, said article seizing means being arranged in parallel rows generally transverse to the direction of movement of the unloading carriage from the article seizing station to the article release station, the article seizing means in one row being staggered with respect to the article seizing means in at least one other row, and means for sensing the presence of an article in each of said article seizing means, said means for sensing the presence of an article in each of said article seizing means including support means arranged transversely to the direction of movement of the unloading carriage, a plurality of switches on said support means fixed in a single row, a first set of said switches being positioned to engage articles in one row and a second set of said switches being positioned to engage articles in another row.

3,974,920
MACHINE LOADER AND UNLOADER
Richard Leigh Bumann, Olivenhain, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Nov. 18, 1974, Ser. No. 524,752
Int. Cl.² B65G *35/00*
U.S. Cl. 214—1 F **3 Claims**



1. A workpiece loader-unloader for a machine comprising:
a table with a major surface for supporting a workpiece in alignment with a work station in the machine;
a carriage supported by said table and longitudinally movable thereon;
retractable posts projecting from said table surface for aligning said workpiece;
gripping means disposed on said carriage for gripping the workpiece, said gripping means being mounted on wheels disposed in a recess in the table surface during initial contact of the workpiece by the gripping means;
means for retracting said posts from said table surface;
driving means for moving said carriage along the table surface toward and away from the work station, said wheels of said gripping means riding on the table surface during movement toward the work station to thereby raise the workpiece from the table surface; and
control means for said driving means and said gripping means to control the motion of said driving means and the gripping action of said gripping means.

3,974,921
BOARD PILING APPARATUS
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan
Filed May 29, 1975, Ser. No. 581,734
Claims priority, application Japan, Dec. 18, 1974, 49-145914
Int. Cl.² B65G *57/28*
U.S. Cl. 214—7 **3 Claims**



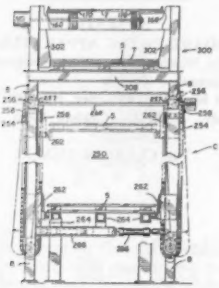
1. A board piling apparatus whereby the board delivered individually or in small bundles in a flatly laid-down state are raised up and collected in a lot and the collected boards are then turned about 90° to form a pile of boards, characterized by incorporation of a board raising-up device comprisng a conveyor by which said boards delivered in a flatly laid-down state are received in the form as they are, a first lever pivotally supported at a position lower than the carriage surface of said conveyor, means for turning said first lever so that the first lever rises up above the carriage surface of said conveyor to lift up the leading end of the board and raise up the board on said conveyor and thereafter said first lever falls down below the carriage surface of said conveyor, a second lever pivotally supported at a position lower than the carriage surface of said conveyor, means for turning said second lever so that the second lever rises up above the carriage surface of said conveyor to lift up the trailing end of the board and raise up the board on said conveyor and thereafter said second lever falls down below the carriage surface of said conveyor, a board holding lever pivotally supported at a position below the carriage surface of said conveyor and slightly closer to the delivery end of said conveyor than the pivotted point of said second lever, and means for turning said board holding lever so that the board holding lever rises up above the carriage surface of said conveyor so as to hold the lower end of the board raised up by said second lever and thereafter said board holding lever falls down below the carriage surface of said conveyor.

3,974,922
CAN DEPALLETIZER
Jerome A. Selusnik, Chicago; Robert W. Wolfe, Oak Lawn; William J. Cartwright, Palos Park, and Oliver C. Tate, Darien, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Division of Ser. No. 364,591, May 29, 1973, Pat. No. 3,869,049. This application Feb. 28, 1975, Ser. No. 554,078
Int. Cl.² B65G *59/06*
U.S. Cl. 214—8.5 K **7 Claims**

1. In a depalletizer for unloading tiers of containers separated by paperboard from a pallet, said depalletizer having an elevator, discharge means and conveyor means for separately discharging and conveying to a collection area the containers, paperboard and pallets adjacent the top of said elevator, the improvement comprising a pallet elevator including:
a. an elevator shaft adjacent said conveyor means for pallets for receiving empty pallets therefrom;
b. two elevator units pivotally attached to the top of said elevator shaft with one elevator unit being separated from

the other a distance greater than the width of an intended pallet;

c. said elevator units including vertically reciprocal members for receiving a pallet and lowering same; and



d. expansible motors connected to lower portions of said elevator units for pivoting said elevator units apart to release pallet in a lower part of said elevator shaft.

3,974,923

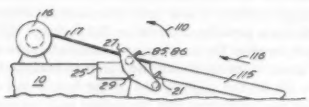
TILTING RAMP ASSEMBLY FOR FISHING VESSELS

Viggo Mark, 1401 - 1460 Barclay, Vancouver, British Columbia, and Matthew John Sikich, 3171 Westmount Place, West Vancouver, British Columbia, both of Canada

Filed Sept. 16, 1974, Ser. No. 506,334

Int. Cl.² B63B *27/00*

U.S. Cl. 214—15 R **10 Claims**



1. A tilting ramp assembly adapted for fitting to a fishing vessel in which the fishing vessel has a central longitudinal axis and a transom at the stern thereof, the ramp assembly being adapted for attachment adjacent the transom, the ramp assembly having:

a. a fixed portion secured to the vessel, the fixed portion having a first hinge portion including a pair of spaced parallel fixtures adapted to be secured adjacent the transom, each fixture having a bracket extending therefrom, the brackets having aligned bores,

b. a moving portion having a second hinge portion complementary to the first hinge portion to form a hinge having a hinge axis concentric with the aligned bores of the fixed portion and disposed normally to the longitudinal axis of the vessel and generally horizontally when the vessel floats without list, so that the moving portion can be swung relative to the fixed portion between raised and lowered positions, the moving portion having a ramp platform with inner and outer ends which are relatively unrestricted to facilitate passage of items along tge ramp platform, the moving portion also including bearing means complementary to the brackets of the first hinge portion to form the hinge and provided adjacent the inner end of the ramp platform,

c. first and second rollers provided generally adjacent the outer and inner ends of the ramp platform, each roller being journalled for rotation about a respective central axis thereof disposed parallel to the hinge axis, the first roller being disposed on a side of the hinge axis remote from the second roller so that the first roller can swing below the hinge axis towards the water,

d. powered means cooperating with the fixed and moving portions to swing the moving portion between the raised and lowered positions.

3,974,924

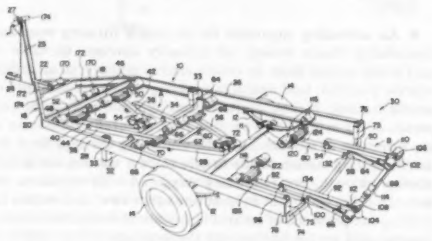
BOAT TRAILER

Myron E. Ullman, Jr., Canfield, Ohio, assignor to Tee Nee Trailer Company, Youngstown, Ohio

Filed July 12, 1974, Ser. No. 487,861

Int. Cl.² B60P *3/10*

U.S. Cl. 214—84 **26 Claims**



1. In a boat trailer for towing a boat behind a towing vehicle and for launching and landing said boat onto and from a body of water respectively, said trailer including a wheel supported main frame having a pair of side rails; means to secure the forward end of said main frame to said towing vehicle; and in means to cradle and to load and unload a boat from the rear end of said trailer, the improvement in cradle means comprising:

a. a cross brace secured to the rear ends of said side rails;

b. extension means secured to and extending fore and aft of said cross brace;

c. a pair of lever arms fulcrumed on the rear end of said extension means;

d. connecting means secured to the rear ends of said lever arms;

e. a pair of hull supporting arms pivotally connected to said extension means forward of said lever arms and with the free ends of said hull supporting arms positioned aft of their pivotal connections;

f. lift means on the free ends of said lever arms to liftingly engage said hull supporting arms;

g. keel supporting means on said connecting means adapted to receive the keel of a boat thereon; and

h. hull supporting means on the free ends of said hull supporting arms to engage opposite sides of a boat hull, whereby the weight of the portion of a boat carried by said cradle is proportionately distributed between the said load bearing keel and hull supporting means.

3,974,925

LOADER AND TREE REMOVER

Girard J. McKenzie, 1486 Hawthorne Drive, Sebring, Fla. 33870

Filed May 29, 1975, Ser. No. 581,900

Int. Cl.² B66C *3/04*

U.S. Cl. 214—147 G **5 Claims**

1. A tree remover device comprising:

a. a vehicle (11) with a front end;

b. an elongated boom (23) one end of said boom being pivoted to said front end;

c. a jaw plate (35) pivotally affixed to the other end of said boom, with a lower jaw (27) affixed to said jaw plate (35) and lower teeth (29) extending outwards from the bottom of said lower jaw (27);

d. an upper jaw (31) pivoted to said lower jaw and upper teeth (33) extending outwards from said upper jaw (31), with a rear tail piece (57) extending to the rear thereof;

e. first, second and third jacks, said first jack (41) being connected to said front end and said boom (23) for raising and lowering said boom, said second jack (43) being connected to the rear of said boom (23) and said jaw

plate (35) to pivot said jaw plate (35) on said boom to raise and lower said lower teeth (29), said third jack (45) being pivoted to the front of said boom and connected to said rear tail piece, said first jack (41) extending parallel to said boom (23), said boom 23 having a pivot piece (47) with a pivot point mounted towards the center thereof, said first jack (41) being coupled to said pivot point.

3,974,926

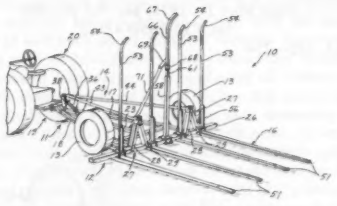
BALED HAY TRANSPORTER

Larry A. Kopaska, Rte. 3, Guthrie Center, Iowa 50115

Filed June 10, 1974, Ser. No. 477,750

Int. Cl.² E02F *3/00*

U.S. Cl. 214—352 **6 Claims**



1. Apparatus for transporting baled hay comprising:

frame means adapted to be connected to the drawbar of a prime mover;

crossbar means pivotally mounted to the rear of said frame means and including an elongated bar extending transversely and at right angles to the direction of movement of said apparatus;

ground engagable wheels secured to each end of said crossbar means in fixed angular relationship therewith, said ground engageable wheels each includes an arm fixedly secured to an end of said bar such that the angular relationship between said bar and each said arm remains the same at all times;

power means pivotally secured to and extended operatively between said frame means and said crossbar means and operable to pivot said crossbar means about said frame means between first and second positions; and

bale engaging means secured to said crossbar means and extended rearwardly therefrom for engagement with baled hay, said bale engaging means operable in said crossbar means first position to lift the baled hay from a normally ground engaging position to a raised position for transporting, said bale engaging means lifting operation in response to the pivoting of said crossbar means to said second position.

3,974,927

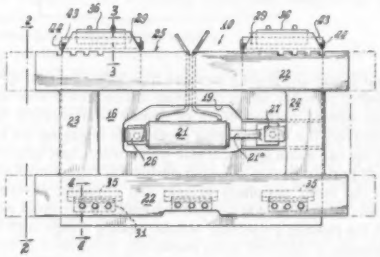
SIDE SHIFTER ASSEMBLY FOR LIFT TRUCKS

Frank C. Schuster, Peoria, Ill., assignor to Little Giant Products, Inc., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,222

Int. Cl.² B66F *9/14*

U.S. Cl. 214—730 **9 Claims**



1. In a side shifter assembly for a lift truck having a vertically movable carriage, said assembly comprising: a vertically disposed face plate adapted for securement on said carriage and for movement therewith, a bearing block member on the upper end of said face plate, a horizontally shiftable frame structure, means slidably connecting the lower portion of said frame structure to said face plate, a slide bearing member on the upper end of said frame structure overlying said bearing block member, a recess arranged between said members, an elongated wear bar arranged in the recess, said recess being closed at its ends to prevent longitudinal shifting of the wear bar, and a load carrying structure carried by said frame structure said wear bar being shaped so that upon turning it relative to said recess, surfaces of the wear bar and said recess each continue to have angularly disposed longitudinal surfaces in registering alignment with one another whereby the shifting path of the frame relative to said face plate is the same irrespective of said turning.

3,974,928

CHILD RESISTANT SAFETY CLOSURE AND CONTAINER ASSEMBLY

John F. Domaracki; Leonard M. McBride, and Frank Wack, all of Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

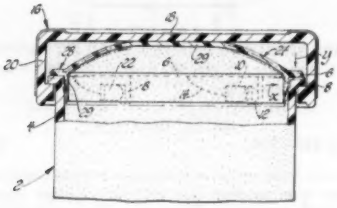
Filed May 7, 1975, Ser. No. 575,298

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—211 **2 Claims**

1. A safety closure assembly comprising: a cap having an end wall with a skirt projecting therefrom and a plurality of peripherally spaced bayonet locking elements formed on the inner surface of the skirt adapted to be engaged with and disengaged from complementary container bayonet locking elements on a container by combined axial and rotary motion

of the cap relative to such container, and a spring and sealing member for sealingly engaging a container to which the cap is adapted to be applied and at the same time biasing the cap locking elements into locked engagement with the container locking elements, wherein the improvement comprises the spring and sealing member comprising a unitary plastic body having a sealing portion and a biasing portion, said sealing portion including a radially projecting, annular sealing flange for overlying the rim of the container and an axially extending sealing flange adapted to be received in the mouth of the container for sealing engagement with the inner surface thereof, said radially projecting, annular sealing flange overlying the cap locking elements to prevent axial separation of



said spring and sealing member from said cap, said spring and sealing member being otherwise unconnected with said cap; said biasing portion being of domed configuration having a relatively flat cap engaging portion for engaging the end wall of the cap and a spherical side wall portion, said spherical side wall portion having an upper peripheral edge joined integrally to the outer periphery of said cap engaging portion and a lower peripheral edge joined integrally to the inner periphery of the radially projecting annular sealing flange such that the peripheral side wall bows outwardly when the cap is applied to a container due to compression of the side wall between the end wall of the cap and the radially projecting annular sealing flange caused by movement of the latter toward the end wall of the cap when the cap is applied to the container.

3,974,929

CHILD RESISTANT CLOSURE

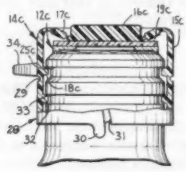
Gary Van Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Continuation-in-part of Ser. No. 401,838, Sept. 28, 1973, Pat. No. 3,894,647. This application June 11, 1975, Ser. No. 585,782

The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—216 **10 Claims**



1. A substantially leak-proof container combination, said combination comprising,

a. a container having a tubular neck portion and a body,

b. a one-piece cap for said container, said cap having a disc-like top, a tubular skirt and a resilient annular shoulder portion means connecting said skirt and said top,

c. circular sealing means on the under side of said cap top and engageable with the end of said container neck for sealing said neck, and

d. cooperating retaining means on said container neck and on said cap skirt for retaining said cap on said neck in sealing position,

e. said shoulder portion means being stretchable for downward movement of said cap skirt for compensating for tolerance variations in said cooperating retaining means and in the positions of said cooperating retaining means on said container neck and on said cap skirt.

3,974,930

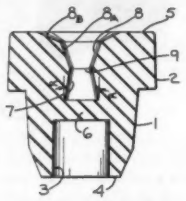
STOPPER FOR SPECIMEN CONTAINER

Pierre Gizard, Eybens, and Jean Boyer, Echirolles, both of France, assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Apr. 9, 1975, Ser. No. 566,360

Int. Cl.² B65D *47/36*

U.S. Cl. 215—247 **4 Claims**



1. A stopper comprising; a body surmounted by a head, a central shaft closed by a membrane, said shaft having at least two portions, each of said shaft portions having an upper end and a lower end, the first portion of said shaft extending upwardly and narrowing inwardly from said membrane, the second portion of said shaft being directly connected at its lower end to the upper end of said first portion and diverging outwardly from the upper end of said first portion so as to provide a constriction at the area at which said first and second shaft portions are directly connected.

3,974,931

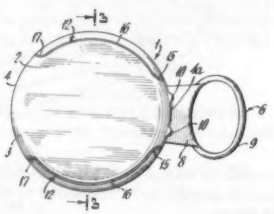
BOTTLE CAP

Thomas G. Moller, Rahway, N.J., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.

Filed May 29, 1975, Ser. No. 581,881

Int. Cl.² B65D *41/42*

U.S. Cl. 215—254 **7 Claims**



1. A tear-off convenience bottle cap comprising a circular top panel surrounded by a cylindrical skirt terminating in a lowermost free edge, a radiused juncture portion connecting said top panel and said skirt, a ring shaped gripping ear formed as an integral part of said skirt extending downwardly and radially outwardly from said free edge, a tearing zone commencing at said skirt free edge on either side of said gripping

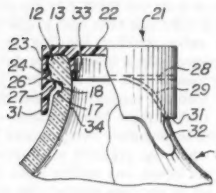
ear and extending upwardly across said skirt in an outwardly diverging pattern, each of said tearing zones blending into a circular path lying in close proximity to the periphery of said cap top panel at the commencement of said radiused juncture portion, said tearing zones extending rearwardly from said gripping ear to a point substantially beyond the midsection of said cap top panel and flaring radially outwardly and terminating in close proximity to said cap skirt, whereby the major portion of said cap top panel is separated from said cap skirt upon opening.

3,974,932

CAP WITH TEAR STRIP FOR CONTAINER NECKS

George W. Faulstich, San Carlos, Calif., assignor to Three Sisters Ranch Enterprise, San Carlos, Calif.

Filed May 27, 1975, Ser. No. 580,556
Int. Cl.² B65D *41/46*
U.S. Cl. 215—256 4 Claims



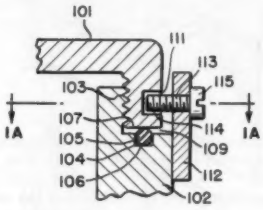
1. In combination, a plastic, thin-walled container having a neck with a smooth inside diameter, an even top edge, and on the exterior of said neck a top bead, a first reduced diameter portion below said top bead with a substantially horizontal first shoulder above said first reduced diameter portion, a second reduced diameter portion below said first reduced diameter portion with a substantially horizontal second shoulder above said second reduced diameter portion, the external diameter of said neck between said first and second reduced diameter portions being substantially less than the external diameter of said neck above said first reduced diameter portion, said neck widening downwardly-outwardly below said second reduced diameter portion; and a cap of resilient, tearable plastic material formed with a flat top disk fitting on top of said top edge and a peripheral outer skirt depending from said disk and fitting over the outside of said neck, the exterior of said outer skirt comprising a substantially smooth cylinder, the inside of said outer skirt having an upper portion fitting outside said top bead, an upper internal bead fitting under said first shoulder, a lower internal bead fitting under said second shoulder and into said second reduced diameter portion, the inside diameter of said outer skirt being greater above said top bead than at said top bead and greater at said top bead than at said lower bead and about the same below said lower bead as above said top bead, said outer skirt formed with a circumferential reduced thickness portion immediately above said lower internal bead, with a slanted reduced thickness portion extending upward from the bottom edge of said outer skirt and merging with said circumferential reduced thickness portion and with a pull tab depending from the lower edge of said skirt adjacent said slanted reduced thickness portion, whereby by pulling said tab the portion of said skirt below said circumferential reduced thickness portion may be torn away.

3,974,933

EXPLOSION PROOF AND WATERTIGHT ENCLOSURE WITH INSPECTABLE MEANS FOR VERIFYING VALIDITY OF RECLOSURE

Maria Toth, Terryville, and Frank L. Browne, Bristol, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Nov. 14, 1975, Ser. No. 631,980
Int. Cl.² H02G *3/08*
U.S. Cl. 220—3.8 14 Claims



1. An enclosure for electrical equipment comprising in combination:

a. a threaded compartment section;

b. a cover for said compartment section having threads for mating with the threads of said compartment section;

c. gasket means, disposed for contact by parallel surfaces of said compartment section and said cover when they are in mated relationship, for providing a seal between the interior and exterior of said compartment section when said gasket is contacted by said parallel surfaces in response to relative rotation of said cover and said compartment section to engage a predetermined portion of said mating threads; and

d. visually inspectable locking means engageable with and cooperating with said cover and said compartment section for severely restricting the degree of possible relation rotation between said cover and said compartment section only when said predetermined portion of said mating threads are engaged.

3,974,934

RIGID CONTAINER ENCLOSED ON FIVE SIDES

Benedikt Rohner, Zurich, Switzerland, assignor to Spichtig AG Kunststoffwerk Steinen, Steinen, Switzerland

Filed Mar. 22, 1974, Ser. No. 453,800
Claims priority, application Switzerland, Mar. 23, 1973, 4306/73
Int. Cl.² B65D *11/16*
U.S. Cl. 220—4 F 7 Claims

1. A rigid container assembly enclosed on five sides, comprising:

a bottom panel;

a top panel identical to said bottom panel;

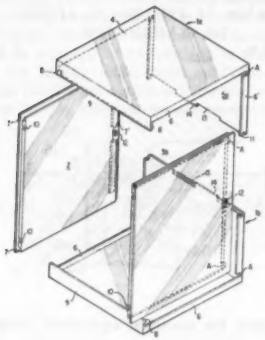
a rear panel integrally formed with and secured to said bottom and top panels, said rear panel comprising two separable sections, one of said sections being rigidly secured to said bottom panel so as to form a first L-shaped member therewith while the other one of said sections is rigidly secured to said top panel so as to form a second L-shaped member therewith; and

a pair of identical side panels attachable to and separable from said bottom, top and rear panels,

said bottom, top and rear panels being integrally provided with upwardly, downwardly, and forwardly projectng ribs disposed along the side edges thereof, respectively, and the bottom, top and rear peripheral edges of said side panels being provided with slots for mating with and receiving said ribs of said bottom, top, and rear panels,

the forward edges of said bottom and top panels also being respectively provided with upwardly and downwardly

projecting frame members, disposed parallel to said rear panel, which include rearwardly projecting barb-shaped projections which engage correspondingly configured notches provided within the front edges of said side panels,



whereby said container may be fabricated from a minimum number of separate and different components, all of said components being interconnected with each other without the need for additional hardware.

3,974,935

STORAGE CONTAINERS FOR LIQUEFIED GASES

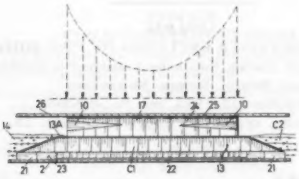
Roger Cambridge Ffooks, Billingshurst, England, assignor to Conch Lng (General Partnership), Moorsetown, N.J.

Filed Sept. 6, 1974, Ser. No. 503,655

Claims priority, application United Kingdom, Sept. 8, 1973, 42315/73

Int. Cl.² B65D *25/18*

U.S. Cl. 220—9 LG 7 Claims



1. A container for the large-scale storage of liquids at temperatures greatly differing from ambient temperature and comprising a tank surrounded and supported at least from below by thermal insulation in an outer rigid shell, the insulation layer supporting the bottom of the tank including bearer members of load bearing material capable of supporting the loaded weight of the tank, characterized in that inserts (10, 10*a*, 10*b*) are provided extending inwardly from the sides of said members (3), the inserts being of a resilient material characterized in that compressibility of the inserts varies whereby, at any point toward a side of a bearer member, the resilience provided is sufficient to relieve the static and dynamic loading normally applied at that point by the tank (26) and its contents due to deformation of the tank bottom where it extends beyond the side of a bearer member, and further characterized in that the inserts comprise two wedge-like pieces rigidly located in tapered recesses in the sides of said members, with the thick ends facing outwardly and the thin edges of said pieces toward each other, to provide increasing resilience toward the sides of the bearer members.

3,974,936

CLOSURE CAP

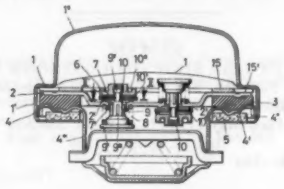
Theodor Gerdes, Langenfeld, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Rhineland, Germany

Filed Sept. 18, 1975, Ser. No. 614,636

Claims priority, application Germany, Sept. 20, 1974, 2444982; Jan. 24, 1975, 2502898

Int. Cl.² B65D *51/16*

U.S. Cl. 220—204 12 Claims



1. In a closure cap including a rigid insert plate defining vent holes, valve members supported in said vent holes, said valve members being adapted to open and close said vent holes subject to the action of compression springs supported on said rigid insert plate, at least one valve member allowing air or gas to pass through at least one vent hole in one direction and at least one other valve member allowing air or gas to pass through another vent hole in the opposite direction, the valve members being constituted by a sealing plate supported against annular toroidal supports pressed out of the insert plate, one such sealing plate being located above the insert plate and a second sealing plate being located below the insert plate such that when the pressure on opposite sides of the insert plate are not equal, one sealing plate is removed from its support and air or gas pass through the thus opened vent hole to equalise the pressure the improvement for the sealing, said improvement comprising providing raised annular collars on the circumferential edge of a valve disc associated with each valve member, whereby the sealing plates are pressed against said toroidal supports under the action of the compression springs, the collars being of somewhat larger diameter than the diameter of the toroidal supports on the insert plate.

3,974,937

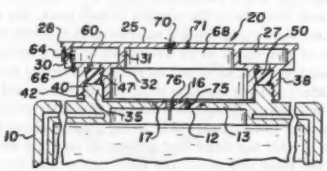
MONITORY CLOSURE SEALING MECHANISMS FOR STORAGE FACILITIES

George H. Eaton, P.O. Box 91294, West Vancouver, British Columbia, Canada

Filed Oct. 6, 1975, Ser. No. 620,111

Int. Cl.² B65D *53/00*

U.S. Cl. 220—239 28 Claims



1. A sealing mechanism for a storage facility having an inlet opening, a removable closure for said opening, and means to releasably secure the closure to the storage facility, said sealing mechanism comprising a first seat on the storage facility and extending around the opening thereof, a second seat formed on the closure of the storage facility and opposed to said first seat and in registry therewith when the closure is

positioned to close the inlet opening, a compressible sealing ring to fit against the registering first and second seats, said second seat being contoured to fit over substantial portions of opposite sides of the sealing ring to retain the ring in place, a closed gas chamber in the closure having an outlet opening through the second seat, said outlet opening being closed by the sealing ring, and means to admit gas into the closure chamber, whereby gas under pressure in said chamber presses the sealing ring against the first seat and said sides of the ring against the contoured second seat to prevent leakage from the storage facility through the inlet opening thereof and from the gas chamber.

3,974,938

TAMPER-PROOF SEALS

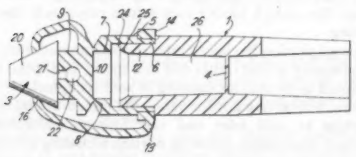
Brian Lee Steadman, Alcester, England, assignor to Avon Medicals Limited, Melksham, England

Filed Nov. 13, 1975, Ser. No. 631,475

Claims priority, application United Kingdom, Nov. 18, 1974, 49836/74

Int. Cl.² B65D *41/32*

U.S. Cl. 220—266 **12 Claims**



1. A tamper-proof seal for an access opening to a container, consisting of a tube having an axial direction, a line of weakening around the said tube, an access passage defined by the tube at one axial side of the said line of weakening, an end wall, the end wall blanking off the tube at the axial side of the said line of weakening opposite to the said one axial side, a strap attaching the end wall to the tube portion defining the access passage, and an obturator, the obturator being attached to the said strap, the obturator comprising a tamper-proof seal for the access passage, whereby on destruction of the first said tamper-proof seal constituted by the line of weakening the access passage is revealed for re-sealing by the second said tamper-proof seal, the said second seal being arranged to indicate when it has been thereafter disturbed from its access denying position.

3,974,939

SYSTEM FOR INJECTING PARTICULATE MATERIAL INTO THE COMBUSTION CHAMBER OF A REPETITIVE COMBUSTION COATING APPARATUS

Rosser B. Melton, Jr., Helotes, and Elbert M. Hubbard, Dallas, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 458,884, April, 1974, Pat. No. 3,893,578. This application Nov. 4, 1974, Ser. No. 520,671

Int. Cl.² B65D *47/10*

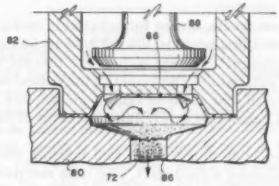
U.S. Cl. 222—1 **4 Claims**

1. The method for repeatedly injecting measured quantities of particulate material into a chamber which comprises:

encapsulating a measured quantity of particulate material in a plurality of capsules each of a given volume formed of thin film material having a sealed periphery, a pneumatic inlet face and a pneumatic outlet face, the capsules forming a continuous tape, successively positioning the capsules in a pneumatic stripping chamber wjth the outlet face adjacent an outlet port communicating with the chamber,

clamping the tape around the periphery of each capsule as the capsule is positioned within the stripping chamber,

injecting a greater volume of gas than said given volume and at a higher pressure than the pressure in the chamber into



the interior of the capsule, bursting the outlet face by said pressure, pneumatically stripping the particulate material from the capsule, and

directing the gas and particulate material issuing from the outlet face into the chamber.

3,974,940

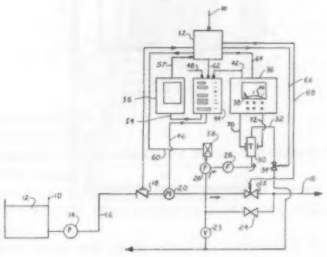
METHOD AND APPARATUS FOR CONTROLLING THE DISCHARGE OF CONTAMINANTS FROM SHIPS

Ivan Bartik, 727 Timber Lane, Cookeville, Tenn. 38501

Filed Feb. 24, 1975, Ser. No. 552,130

Int. Cl.² B63B *35/00*

U.S. Cl. 222—52 **11 Claims**



8. A method of controlling the rate of discharge of contaminants from a ship during the discharge of contaminated fluid therefrom which comprises; measuring the contaminants per unit volume of the fluid discharged from the ship, measuring the volumetric rate of discharge of contaminated fluid from the ship, measuring the speed of travel of the ship, processing the values obtained from the said measurements to obtain a value representative of the amount of contaminant discharged from the ship for each unit of distance travelled by the ship, and controlling the discharge from the ship to maintain said value below a predetermined amount.

3,974,941

AUTOMATED AEROSOL MIST DISPENSER

Leo L. Mettler, 8352 W. Granite Drive, Roseville, Calif. 95678

Filed Dec. 16, 1974, Ser. No. 532,939

Int. Cl.² B67D *5/08*; **G04C** *23/48*

U.S. Cl. 222—70 **2 Claims**

1. An automated aerosol mist dispenser for use with an aerosol can having a stem valve capable of emitting pressurized fluid when open, said dispenser comprising:

a. a housing;

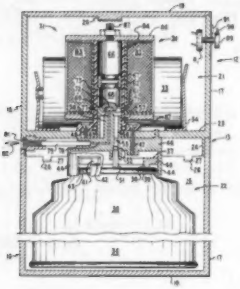
b. a sleeve mounted on said housing, said sleeve defining a cylindrical chamber having a predetermined diameter;

c. an electromagnetically responsive piston disposed within said cylindrical chamber between one end and the other

end thereof, said piston being reciprocable in said cylindrical chamber between a first position and a second position and having a passageway between the opposite ends of said piston to afford fluid communication between the respective one end and other end of said cylindrical chamber;

d. electromagnetic means for selectively moving said piston from said first position toward said second position, said electromagnetic means including a first RC circuit capable of determining the extent of the period between energization of said electromagnetic means, and a second RC circuit capable of determining the term of each energization;

e. a valve body mounted on said housing and including a tube forming a fluid duct, said tube extending from said valve body into said one end of said cylindrical chamber toward the adjacent one end of said piston and terminating in an annular valve seat covered by the adjacent said one end of said piston in said first position of said piston and uncovered by said one end of said piston in said second position,



f. a fluid inlet port in said valve body adapted to receive the stem valve of the aerosol can and to maintain said stem valve in open position, said fluid inlet port being thereby subject to a constant pressure from the pressurized fluid in said can and transferring said pressurized fluid from the can to said one end of said chamber, the pressure thus established in said one end of said chamber being transferred through said passageway to said end of said chamber to effect a pressure balance on the opposite sides of said piston;

g. a spray nozzle in communication with said fluid duct for atomizing the fluid emergent from said nozzle; and,

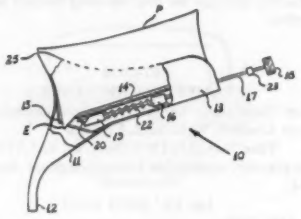
h. spring means located in said sleeve in engagement with the other end of said piston for biasing said piston from said second position toward said first position without the assistance of fluid pressure, said electromagnetic means being capable when energized of overcoming the force of said spring means so as to move said piston from said first position toward said second position and thereby uncover said annular valve seat to permit the flow of pressurized fluid from the aerosol can through said inlet port and said one end of said chamber and from said one end of said chamber through said fluid duct to emerge as an atomized mist from said nozzel.

3,974,942

POUCHED OIL DISPENSER

Peter Harrison Gray; Grant David Row, both of Kingston, and John David Stinson, Napanee, all of Canada, assignors to Du Pont of Canada Limited, Montreal, Canada

Filed Oct. 11, 1974, Ser. No. 514,257
Claims priority, application Canada, Apr. 30, 1974, 198577
Int. Cl.² B67B 7/26
U.S. Cl. 222—83.5 **7 Claims**



1. An apparatus for dispensing a liquid packaged in a thermoplastic film pouch having ears into a receptacle therefor comprising:

a. a funnel portion having an inlet end and an outlet end and terminating at said outlet end in a spout, said spout being adapted to fit into an opening in said receptacle,

b. a pouch receiving portion integrally joined to said funnel portion at said inlet end and forming an extension thereof, said pouch receiving portion including a bottom,

c. a pouch support having a funnel end in and covering said bottom of said pouch receiving portion and extending into said funnel portion in a manner to support on its upper surface said pouch such that one of said ears projects over said funnel end of said pouch support into said funnel portion,

d. at least two knife blades mounted in a spaced relationship in a face of a knife support and positioned beneath said pouch support, said knife blades being movable from said position beneath said pouch support to a position in said funnel portion so as to cut open said one of said ears of said pouch, said knife support being attached to one end of a plunger arm, said plunger arm extending the length of said pouch receiving portion and protruding therefrom at its other end, said plunger arm being supported for reciprocal movement by a guide, and

e. a coil spring housing a portion of said plunger arm and connected at one of its ends to said knife support and at the other of its ends to said guide for returning said knife blades to said position beneath said pouch support.

3,974,943

PASTE DISPENSING DEVICE

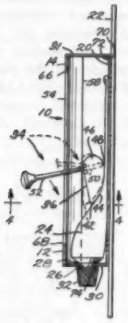
Arthur Lloyd Wilston, 300 Redington Ave., Troy, Pa. 16947

Filed Apr. 9, 1975, Ser. No. 566,325
Int. Cl.² B65D 35/28
U.S. Cl. 222—103 **1 Claim**

1. Apparatus for dispensing material contained in a collapsible tube comprising:

a plurality of walls including a top and first and second end walls connected together to define a housing enclosure for the tube, said first end wall having an aperture for receiving the neck of said tube, said top wall extending between said end walls, said top wall having a part cylindrical portion having opposite sides, a central portion and extending the length of said housing, a slot formed in said central portion of said cylindrical portion extending between said end walls, a planar shoulder portion extending from each side of said part cylindrical portion with said shoulder portions extending the length of said housing substantially perpendicular to said side walls,

a solid press member slidably disposed in said housing, said solid press member having a flat top surface having outer parallel side edges each being immediately adjacent and engageable with a said shoulder portion so as to be slidable thereon, said press member including a leading edge and a rear portion both extending between said outer parallel side edges, a base located adjacent said rear portion, and perpendicularly spaced from said top surface, a gradually sloping curved pressing surface extending from said leading edge to said base, said top surface having a handle receiving opening formed centrally therein with respect to said parallel side edges and adjacent said rear portion.



a handle member having one end thereof removably secured in said handle receiving opening in said top surface of said press member and extending substantially perpendicular from said top surface through said slot in said top wall of said housing.

3,974,944

TONER DISPENSER

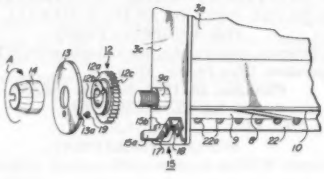
Osamu Takeuchi, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Oct. 15, 1974, Ser. No. 514,516

Claims priority, application Japan, Apr. 18, 1974, 49-42784

Int. Cl.² B65G *3/12*

U.S. Cl. 222—197 **3 Claims**



1. In a toner dispenser having a reservoir and a roll mounted within the reservoir for rotation about a predetermined axis for dispensing toner from the reservoir, the improvement comprising:

means coupled to said roll for imparting an axial, vibratory component of motion thereto in response to rotation of said roll,

said roll including a groove for metering toner from said reservoir, and a brush-like wiper frictionally engaged with said roll for dislodging toner therefrom whereby the axial, vibratory motion of said dispensing roll also assists in preventing toner from accumulating in said groove,

said means including an axially inclined circular cam track centered on the axis of rotation of said roll, and a cam follower biased into engagement with said cam track; one of said cam follower and said cam track being relatively stationary and the other being rotated with said roll, and

means for varying the alignment between the dispensing roll and the wiper such that the bristles of the wiper engage different segments of the metering groove over a period of time.

3,974,945

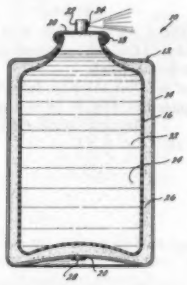
AEROSOL DISPENSING SYSTEM

Norman Donald Burger, Culver City, Calif., assignor to Norman D. Burger, Culver City and Nicholas Mardesich, Palos Verdes Estates, both of, Calif., part interest to each

Continuation-in-part of Ser. No. 544,390, Jan. 27, 1975, Pat. No. 3,983,708, which is a continuation-in-part of Ser. No. 497,613, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 446,140, May 2, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,523

Int. Cl.² B67D *5/06*

U.S. Cl. 222—192 **15 Claims**



1. An aerosol dispensing system comprising:

an outer container;

compressible inner container means positioned within said outer container;

means to compress said inner container means positioned between said inner container means and said outer container;

a spray head and valve assembly connected to said inner container means;

a major amount of a finely divided powder product within said inner container means;

a minor amount of an amorphous silica within said inner container means;

a liquified neutral propellant within said inner container means;

said neutral propellant being adsorbable by said silica;

said neutral propellant being present in an amount sufficient to form a substantially homogeneous wet paste-like slurry or a substantially homogeneous liquid with said powder product and amorphous silica, and

said neutral propellant being at least partially vaporized on passage of the product and neutral propellant through said spray head.

3,974,946

PLEAT MEASURING AND FORMING DEVICE

Pat Gentry, 142 W. 222nd St., Carson, Calif. 90745

Filed Aug. 8, 1975, Ser. No. 602,979

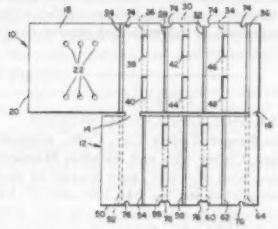
Int. Cl.² A41B *43/00*; D06J *1/00*

U.S. Cl. 223—34 **16 Claims**

1. A pleat measuring and forming device for accurately reproducing identical plates in a fabric material comprising:

a first contiguous rigid material of uniform thickness having a plurality of first and second scorings alternating on each side of said rigid materials for folding said rigid material

accordion style along said alternate scorings, and



a second contiguous rigid material having scorings cooperating with the scorings on said first rigid material for folding said first rigid material.

3,974,947

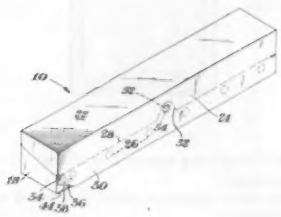
DISPENSING CARTON FOR ROLL MATERIALS

Thomas F. Budny, Lisle, Ill., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 369,624, June 13, 1973, abandoned. This application Aug. 8, 1974, Ser. No. 495,794

Int. Cl.² B26F *3/02*

U.S. Cl. 225—25 **4 Claims**



1. In a dispensing carton for roll material wherein there is generally provided, means for forming an exit opening for withdrawing the material from the carton, and cutting means for cutting off lengths of the dispensed material, the improvement which comprises, a panel comprising at least two plies and presenting a folded edge along said exit opening, and over which said material can be smoothly withdrawn from the carton, a pressure sensitive adhesive material interposed between said plies, an aperture formed through the outermost of said plies to expose the adhesive at the surface of the carton, and thereby provide a tack spot which is recessed to minimize any contamination thereof, and to which the leading end of the roll material can be adhered to prevent its inadvertent withdrawal into the carton.

3,974,948

WEB TENSION CONTROL DEVICE

Dietmar Kroppenstedt, Griesheim, Germany, assignor to Maschinenfabrik Goebel, GmbH, Darmstadt, Germany

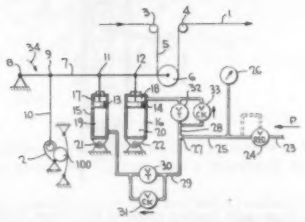
Filed Mar. 5, 1975, Ser. No. 555,600

Claims priority, application Germany, Mar. 11, 1974, 2411482

Int. Cl.² B65H *25/04*

U.S. Cl. 226—38 **4 Claims**

1. A web tension control device for a continuous web fed through a web processing machine over idler rollers arranged in such a manner as to form a web loop, the machine including a web-tension sensing roller in rolling contact with the web at the web loop, and a brake device controlled by the sensing roller for controlling the feed rate of the web to maintain a predetermined tension therein, the web tension control device including a pair of rigid rod members, opposite ends of said sensing roller being rotatably mounted to said rod members at one end thereof, and said rod members being pivotally mounted at the opposite ends thereof to the machine, said brake device being operatively connected to said rod members for control by said sensing roller and said rod members in braking the feed roll of the machine in accordance with pivotal movement of said sensing roller about said opposite ends of said rod members, first and second cylinder and piston units respectively connected between the web processing machine and said rod members, the cylinders of said units respectively having first and second pressure chambers respectively on opposite sides of the pistons thereof, the volumes of said first and second chambers of said units respectively increasing and decreasing during pivotal movement of said sensing roller about said opposite ends of said rod members, a first fluid pressure supply pipeline, first and second fluid pressure pipeline branches connected to said pipeline and respectively to said second pressure chamber of said first unit and to said first pressure chamber of said second unit, whereby a closed fluid pressure system is effected for dampening the pivotal movement of said sensing roller dependent upon the particular position of said sensing roller, and wherein fluid throttle elements together with by-passing one-way fluid check valves are provided in said pipeline branches, said valves in said branches being respectively so disposed as to permit the fluid flow from said supply pipeline toward both said units, whereby said throttle units prevent any braking action on the web during fast starts of the web movement.



3,974,949

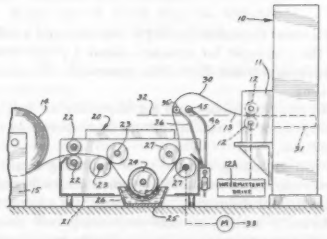
SHEET PREFEEDER FORMING AN OVERHEAD STOCK LOOP TO THE INPUT OF AN INCREMENTAL FEEDER FOR A CUPPING PRESS

Paul S. Petersen, Minnetonka, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jan. 28, 1975, Ser. No. 544,691

Int. Cl.² B65H *25/04*

U.S. Cl. 226—42 **8 Claims**



1. For use in combination with a hydraulic press and sheet feeder having a feed line, the improvement comprising a lubricator assembly including means for receiving a sheet of

material from a coiled supply, means guiding a sheet of material into a lubricating bath, a pair of power roller means for receiving a sheet of material from said lubricating bath and driving such a sheet of material, said power roller means being positioned so that as a sheet of material is received from said lubricating bath and passes through the powered roller means, such a sheet of material is driven in a generally upwardly direction to pass above the feed line of a feeder with which the lubricator is used to form a slack overhead loop of material prior to the entry of such a sheet of material into such a feeder.

3,974,950

APPARATUS FOR DEALING WITH HORIZONTAL BARS

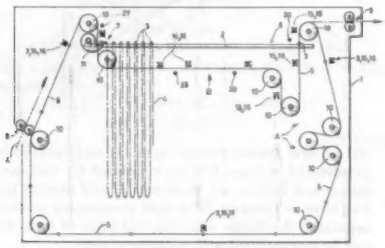
Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed May 27, 1975, Ser. No. 580,998

Claims priority, application Netherlands, June 17, 1974, 7408087

Int. Cl.² B65H *17/00*

U.S. Cl. 226—107 **3 Claims**



1. A device for delivering and picking up horizontal bars at spaced locations spanned by two parallel conveyors each supporting an end of each bar and conveying same along a path between the locations, the conveyors comprising supporting means for retaining or releasing the ends of the bars, said supporting means including a first member secured to each conveyor and provided with a groove which extends at least from the centre to the outside of the member and which is wide enough to allow the passage of an end of a bar, and a second member movably connected with each conveyor and provided with a U-shaped opening which in a particular position coincides with the groove of the stationary member, the conveyor path containing abutments arranged for adjusting said second member of the supporting means.

3,974,951

PRINTER MECHANISM

Alfred G. Kibler, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 12, 1974, Ser. No. 523,180

Int. Cl.² B65H *17/22*

U.S. Cl. 226—143 **11 Claims**

1. A record material feed mechanism comprising:

a. means engaging a record member for moving the record member when operated;

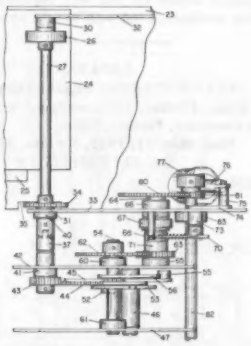
b. a first drive member for operating said moving means to move the record material a distance commensurate with the movement of said first drive member;

c. a second drive member mounted for movement adjacent said first drive member for engaging and moving said first drive member a first predetermined distance when actuated;

d. a third drive member mounted for movement adjacent said first drive member for engaging and moving said first drive member a second predetermined distance when actuated, said second and third drive members mounted in a side-by-side relationship;

e. means engaging said second and third drive members for normally urging said drive members towards an overlapped position;

f. and actuating means engaging said second and third drive members for reciprocally moving said drive members between a first and second actuated position, said actuating means moving the second and third drive members into a tandem position against the action of said engaging



means when moving the drive members from said first to said second actuated position whereby the first drive member will move the record material a distance equal to the sum of said first and second predetermined distances, said actuating means further moving the second and third drive members into an overlapped position when moving the drive members from said second position to said first position whereby the record material will be moved a distance less than the sum of said first and second predetermind distances.

3,974,952

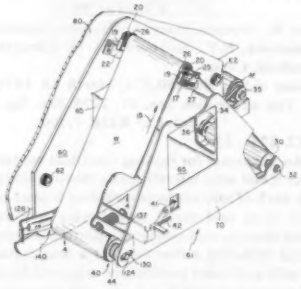
WEB TRACKING APPARATUS

Thaddeus Swanke; Michael S. Montalto, and John E. Morse, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 10, 1974, Ser. No. 504,771

Int. Cl.² B65H *23/02*

U.S. Cl. 226—189 **14 Claims**



1. A passive web tracking apparatus including a frame and web support means mounted on said frame for imparting

lateral stability to a flexible web moving in a path, said web support means comprising:

a first web support disposed at a first location adjacent to the path, said first web support rotating in tracking engagement with the web and constraining the lateral position of the web at the first location; and

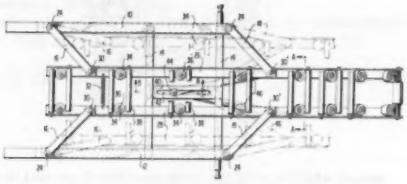
a second web support disposed at a second location adjacent to the path and spaced upstream from the first location for constraining at the second location the lateral spatial position of the web, said second web support including a web supporting surface which rotates in tracking engagement with the web without imposing substantial lateral forces on the web regardless of the lateral angular position of the web in said apparatus.

3,974,953

SELF-CENTERING FEED CONVEYOR

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed Mar. 11, 1975, Ser. No. 557,339
Int. Cl.² B65H 23/16
U.S. Cl. 226—189 5 Claims



1. A conveyor comprising a pair of fixed outer members arranged in spaced parallel relation to one another and at an equidistance from a center line between said members, a pair of automatically self centering inner members arranged in spaced parallel relation to one another and positioned between said outer members, means carried by said inner members for receiving and conveying a strip of material of varying width, a plurality of arm members pivotally connecting said inner members to said outer members, at least one resilient member interconnecting said inner members for urging said inner members into engagement with the edges of said strip of material, means carried by said outer members and interconnecting said inner members to cause an equal but opposite displacement of said inner members in relation to said center line.

3,974,954

APPARATUS FOR MAKING TINED ELECTRICAL CONTACTS

Robert R. Brenan, Warren, Pa., and Gordon L. Johnson, Jamestown, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 450,571, March 13, 1974, abandoned.
This application Jan. 17, 1975, Ser. No. 541,853
Int. Cl.² B23K 31/00
U.S. Cl. 228—13 10 Claims

1. An apparatus for making electrical contacts from a continuous metal strip intermittently moving along a first path of travel, each of said contacts including at least one tine portion formed from said metal strip having a contacting portion secured thereto, said contacting portion comprising a contact material including a first layer of a base material in engagement with said tined portion and a second layer of a precious metal secured to said first layer, said apparatus comprising:

supply means for supplying said metal strip;

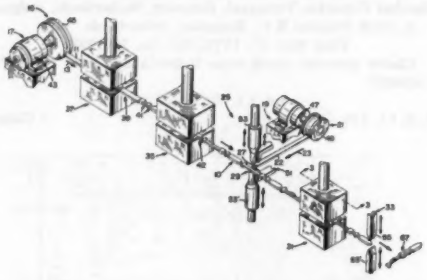
indexing means positioned relative to said supply means for indexing said metal strip to provide said intermittent motion;

supply means for supplying said contact material along a second path of travel;

positioning means positioned relative to said path of travel of said metal strip for positioning a preselected portion of said contact material in mutual alignment with a predetermined area on said strip and for withdrawing the remainder of said contact material in a direction along said second path of travel and away from said preselected portion to separate said preselected portion therefrom;

notching means included within said positioning means for sequentially notching said contact material to define said preselected portion;

welding means positioned relative to said positioning means for welding said preselected portion of said contact mate-



rial to said predetermined area on said strip after said preselected portion has been defined by said notching means and before said remainder of said contact material has been withdrawn from said preselected portion and separated therefrom whereby said layer of base material will be engagement with said metal strip;

forming means positioned relative to said welding means for forming each of said electrical contacts to a desired configuration without reducing the thickness of said preselected portions of said contact material welded to said predetermined areas on said strip; and

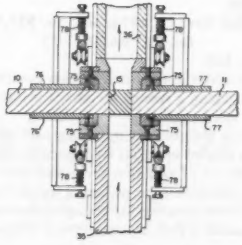
cutting means positioned relative to said forming means for cutting each of said formed contacts from said metal strip.

3,974,955

METHOD AND APPARATUS FOR WELDING MEMBERS TOGETHER

Werner J. Bergmann, Lower Burrell, Pa., and John A. Worden, Hope, Ind., assignors to Aluminum Company of America, Alcoa Center, Pa.

Filed Dec. 5, 1974, Ser. No. 529,903
Int. Cl.² B23K 31/02
U.S. Cl. 228—256 25 Claims



1. A method of welding together two members placed with the edge surfaces to be joined in mutually facing relationship and separated by a weld gap, comprising.

endothermically heating a material to the molten state, flowing the molten material through the weld gap between

the edge surfaces for heating the members with the molten material to cause melting of the edge surfaces, and

then causing the flow of molten material to allow for weld solidification.

15. Apparatus for welding two members together comprising,

means for supporting the members to be joined with the edges to be joined spaced apart a distance equal to the width of the desired joint,

a trough disposed on one side of the members for conveying a stream of molten material horizontally into the space between the members,

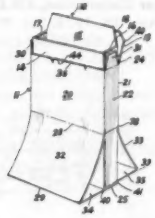
a second trough disposed on the side of the members opposite from the first trough for receiving and conveying the stream of molten material horizontally after it passes through the space between the members, and

means for closing the bottom of the space between the members while the stream of molten metal is flowing through the troughs.

3,974,956
PACKAGING AND DISPENSING CARTON

Theodore G. Delang, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 30, 1975, Ser. No. 645,411
Int. Cl.² B65D *5/38*
U.S. Cl. 229—20 **7 Claims**



1. In combination, a sleeve and a carton for containing or displaying a product,

said carton comprising,

a flat front, a flat rear and flat edges and bottom fixed together forming an open-topped container,

a sleeve,

said sleeve having a tubular portion made up of a flat front, a flat rear, and flat edges forming an open-ended tubular member slidable on said carton and having a length less than the length of said carton,

said front of said tubular member extending downward to the full length of said carton and terminating at said bottom

and means fixing lower end of said flat front to said bottom,

said flat rear of said sleeve extending downwardly the full length of said carton and being fixed to said bottom,

a score line in said flat front between said bottom and said tubular portion dividing the lower part of said flat front into a first panel and a second panel,

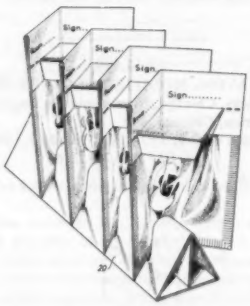
a score line in said flat rear between said bottom and said lower end of said tubular portion dividing the lower part of said flat rear into a first panel and a second panel,

said tubular portion of said sleeve being adapted to slide downwardly on said carton whereby said first mentioned panels move downwardly and swing outwardly from said tubular portion and said second mentioned panels swing outwardly into a common plane with said bottom whereby said first mentioned panels form laterally and downwardly extending supports for said carton.

3,974,957
PACKAGES

Boye Ditlef Benzon-Petersen, Lund, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed May 30, 1975, Ser. No. 582,177
Claims priority, application Sweden, June 5, 1974, 7407413
Int. Cl.² B65D *33/00, 33/02, 73/00*
U.S. Cl. 229—55 **8 Claims**

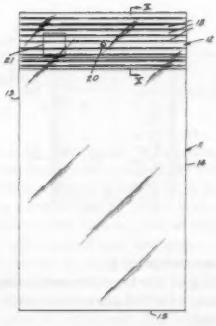


1. A package consisting of a relatively rigid sheet-like back (1) and a flexible, preferably entirely transparent front (2) which is united with the back along a seal line (3, 3*a*, 3*b*), forming a packaging space, said seal line being interrupted along a distance forming an opening (5) for a packaging space, characterized in that the said opening (5) to the packaging space is covered by a sheet cover (4) which is attached to the flexible front (2) below the opening (5) and which is provided with a slot (6) essentially coinciding with the opening, compression of the package in the lateral sense being adapted to open the slot (6) and consequently the opening (5) to the packaging space.

3,974,958
HEADER BAG

Raymond J. Ruda, Chicago, Ill., assignor to Bagcraft Corporation of America, Chicago, Ill.

Filed Oct. 9, 1974, Ser. No. 513,287
Int. Cl.² B65D *33/02*
U.S. Cl. 229—55 **6 Claims**



1. A header bag consisting of only thermoplastic sheet material and comprising a web of flexible thermoplastic sheet material folded over upon itself and having heat-sealed longi-

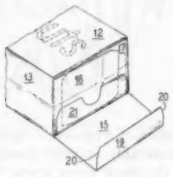
tudinal edges extending transversely to the fold at opposite sides of the bag, the folded end of the bag having a header portion extending in the direction of the length of said web and comprising at least two layers of said material heat laminated together throughout the entire header portion to the end of the bag, there being a heat-embossed stiffening pattern throughout said heat-laminated portion by which portion the flexible bag, when filled, can be supported, said stiffening pattern comprising an area of embossed corrugations extending parallel to the fold, there being imprinting on the web material within said header portion visible through the embossed material, said header portion having an aperture formed while the material thereof was molten during heat-lamination.

3,974,959

BAG HAVING MODIFIED CLOSURE FLAPS

Raymond J. Ruda, Chicago, Ill., assignor to Bagcraft Corporation of America, Chicago, Ill.

Filed Oct. 9, 1974, Ser. No. 513,336
Int. Cl.² B65D *33/16*
U.S. Cl. 229—62 **1 Claim**



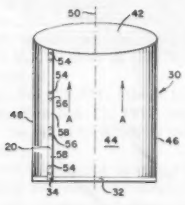
1. A reclosable paper bag having one end that is rectangular from which there extends four side panels, there being four end panels at the opposite end secured to said side panels and disposed in overlapping relation to each other, the outermost one of said end panels having a tab underlying a portion of at least one of the adjacent ones of said end panels, the innermost end panel having a tab extending about the edge of at least one of the intermediate end panels.

3,974,960

PLASTIC TRASH BAG TIE BANDS

John R. Mitchell, 44 Kearney Drive, Lowell, Mass. 01853

Continuation-in-part of Ser. No. 287,599, Sept. 11, 1972, abandoned. This application June 23, 1975, Ser. No. 589,519
Int. Cl.² B65D *33/30*
U.S. Cl. 229—62 **4 Claims**



1. A container comprising:

a large size bag of the type for containing trash, leaves and the like and to be tied around the neck rather than adhesively closed;

said bag being formed of plastic material having a machine direction and having side walls of predetermined length and width terminating in a heat sealed closed end and an opposite open end;

an elongated, polymeric, tie tape of predetermined length and width, formed of material separate from the plastic material of said bag and impermanently attached thereto,

said tie tape being string-like in configuration with a length to width ratio of at least 50 to 1 and a width of about 0.025 to 0.200 inches;

a layer of hot melt, low tack, wax based adhesive, which is substantially tack free below 100°F, and which is not a part of said plastic bag or of said polymeric tie tape, said layer being interrupted in a predetermined pattern of longitudinally spaced spots to form finger holes and peelably affixing said elongated tie tape in an impermanent, readily removable manner along the full length of one said wall of said bag, in parallelism with said machine direction;

said tie tape extending from the open end of said bag, to the closed end of said bag and extending over the heat sealed closed end thereof, the portion thereof overlapping said heat sealed end being exceptionally low in adhesive strength;

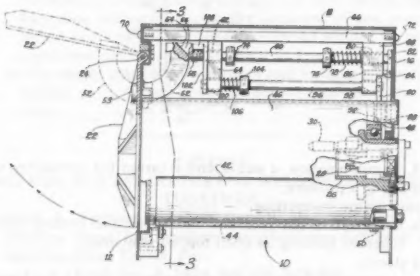
said tape at said heat sealed closed end providing a place to initiate the peelable removal of said tape in addition to the finger receiving spaces under the portions of said tape between said spots of adhesive, and said tape forming a substantially non-adhesive tie strip when peeled off said trash bag which can be tied in a knot without interference from said adhesive.

3,974,961

DOOR LOCK FOR CASH ACCEPTANCE RECEPTACLE

George G. Dominick, Hoffman Estates; Kenneth H. Erickson, Palatine, and Richard M. Price, Des Plaines, all of Ill., assignors to Qonaar Corporation, Elk Grove Village, Ill.

Filed Apr. 18, 1975, Ser. No. 569,588
Int. Cl.² E05G *1/00*
U.S. Cl. 232—16 **6 Claims**



1. In a collection receptacle for receiving valuables in combination with a box wherein the box includes a discharge opening whereby valuables in the box are adapted to be transferred through the opening and into the receptacle, said receptacle defining an area for receiving said box, a door for closing access to said area, and drive means for engaging said box upon closing of the door, said drive means operating to achieve discharge of said valuables into the receptacle, a rotatable plate in the receptacle, said box engaging said plate when the box is received in the receptacle area, operation of said drive means resulting in the rotation of said plate along with said box, a door arm mounted on said door, said door arm, upon closing of said door, operating to free said plate for rotation with said box, said door arm moving into a position within said receptacle when the door is closed and said door arm moving away from said position when the door is opened, the improvement comprising a locking means in said receptacle for locking said door at the commencement of operation of said drive means, said locking means including a blocking arm, a rod supporting said blocking arm at one end thereof, an actuating arm attached at the opposite end of said rod, said

actuating arm engaging said plate whereby rotation of the plate moves said actuating arm and said rod to thereby move said blocking arm into the path of movement of said door arm thereby preventing opening of the door, said door arm having an arcuate path of movement as said door opens and closes, said blocking arm moving into said path of movement upon said commencement of operation of said drive means, and including a recess defined by said plate for receiving said actuating arm when said door is closed and before the commencement of operation of said drive means, rotation of said plate resulting in movement of said actuating arm out of said recess, and further resulting in rotation of said rod about its longitudinal axis to move said blocking arm into said path of movement.

3,974,962

POSITION LIMITING SWITCH ASSEMBLY

Harry E. Sulzer, Warminster, Pa., assignor to Quaker City Gear Works, Inc., Huntingdon Valley, Pa.

Filed Oct. 25, 1974, Ser. No. 517,961
Int. Cl.[2] G06F *15/18*
U.S. Cl. 235—132 R 19 Claims

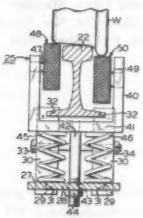
1. A position limiting switch assembly comprising counter means and input drive means operatively engaged therewith for driving said counter means in response to movement of an associated device, actuator means operatively engaged with said counter means for closing or opening associated switch means to or from adjustable limit positions, said counter means and said actuator means being relatively movable to a disengaged position whereby adjustment of said limit positions is facilitated.

3,974,963

RAILWAY WHEEL SQUEAL SUPPRESSION ARRANGEMENT

Peter M. Noble, Valencia, and Philip J. Delvernois, Jr., Monroeville, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 15, 1974, Ser. No. 523,979
Int. Cl.[2] E01B *19/00*
U.S. Cl. 238—382 9 Claims



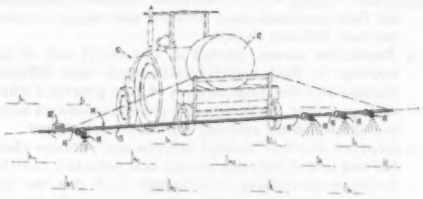
1. In combination, a section of railway track having a pair of running rails for supporting and guiding the wheels of moving railway vehicles, characterized by a plurality of vibrational dampening means positioned at selected points along the running rails for preventing the generation of wheel squealing noises, each of said vibrational dampening means including a support assemblage securely attached to the running rails, each of said vibrational dampening means including a biased wheel engaging means for removing vibrational energy from the passing wheels of the vehicles moving along the running rails and each of said vibrational dampening means including a movable carrier member having at least one rotary device for contacting the passing wheels of the railway vehicle.

3,974,964

LIQUID ATOMIZING METHOD AND APPARATUS

Larry N. Pearce, Oak Park; C. Lyle Lacy, Galena, and Arthur E. Neumann, Winnetka, all of Ill., assignors to Cotton Incorporated, New York, N.Y.

Division of Ser. No. 495,925, Aug. 9, 1974, Pat. No. 3,917,167.
This application June 25, 1975, Ser. No. 590,117
Int. Cl.[2] B05B *1/06*
U.S. Cl. 239—11 6 Claims



1. A method for atomizing a liquid into droplets comprising the steps of:

fitting a thin, normally flat, flexible orifice ribbon means, having a plurality of apertures fashioned therethrough, across a radial aperture fashioned into a conduit adjacent a closed end thereof with the other end of the conduit being in communication with a source of liquid;

fitting a ring having a diameter greater than the diameter of the conduit around the closed end of the conduit;

operably aligning a radial port fashioned through the ring with the radial aperture extending into the conduit;

releasably securing the ring to the conduit wherein the central longitudinal axis of the ring is offset with respect to the central longitudinal axis of the conduit such that edge portions of the orifice ribbon are secured between the exterior surface of the conduit and the interior surface of the ring;

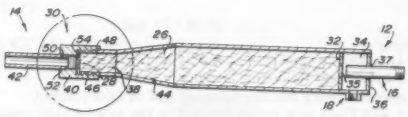
pressuring the liquid within the conduit for issuing streams of liquid through the apertures within the flexible orifice ribbon.

3,974,965

METHOD AND APPLICATOR FOR PRODUCING CLEANING FOAM

Galen R. Miller, Tallmadge, Ohio, assignor to Chemidyne Corporation, Macedonia, Ohio

Filed July 17, 1974, Ser. No. 489,092
Int. Cl.[2] B05B *7/00*
U.S. Cl. 239—413 7 Claims



1. An applicator for combining a regulated quantity of pressurized cleaning liquid and a regulated quantity of pressurized air to produce a cleaning foam, including:

a housing having an inlet and an outlet end;

a diffusion chamber in said housing and in fluid communication with said inlet end of said housing;

a first inlet, peripherally located in said housing at said inlet end and in fluid communication with said diffusion chamber, for supplying pressurized cleaning liquid to said diffusion chamber, wherein said first inlet includes a first flow regulator;

a second inlet, peripherally located in said housing at said inlet end and in fluid communication with said diffusion chamber, for supplying pressurized air to said diffusion

chamber, wherein said second inlet includes a second flow regulator;

a diffusion means secured in said housing, located between said inlet end and said outlet end, to promote foaming of the liquid and air;

a means for retaining said diffusion means within said housing;

a baffle located between said inlets and said diffusion chamber, thereby defining a mixing chamber at said inlet end of said housing, wherein said baffle includes a passageway for fluid communication between said mixing chamber and said diffusion chamber;

a distribution means, located at said outlet end of said housing, in fluid communication with said diffusion chamber, for directing the spray of foam generated within said applicator, the distribution means including a nozzle through which the cleaning foam is propelled; and

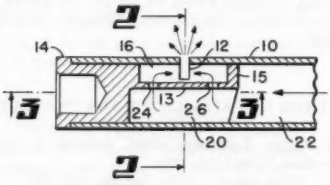
a reduction chamber, located between said diffusion chamber and said distribution means, said reduction chamber having a passageway therethrough such that the inlet orifice of said reduction chamber is substantially the same size as and operatively attached to the outlet orifice of said diffusion chamber while the outlet orifice of said reduction chamber is smaller than the inlet orifice.

3,974,966

MINIATURE FLAT SPRAY NOZZLE

Sidney C. Watkins, Bloomfield, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Aug. 20, 1975, Ser. No. 606,164
Int. Cl.² B05B 1/04
U.S. Cl. 239—590.3 **5 Claims**



1. A flat spray nozzle assembly comprising:

a cylindrical fluid flow conduit;

means closing the downstream end of said conduit;

a wall lying in a plane parallel to the axis of said conduit, said wall dividing a region of said conduit adjacent said end into a fluid outlet chamber and at least one fluid supply chamber, the upstream end of said fluid supply chamber being open;

means closing the upstream end of said fluid outlet chamber;

a transverse slot through said cylindrical conduit, said slot providing an outlet for said fluid, said slot being equidistant from the ends of said fluid outlet chamber, a chord connecting the ends of said slot being parallel to said plane of said chamber dividing wall; and

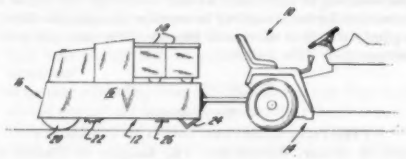
first and second orifices through said chamber dividing wall, one of said orifices being upstream of said slot, the other being downstream of said slot, said orifices being equidistant from said slot.

3,974,967

LAWN-TREATING APPARATUS

Seymour Dudley Wallick, Clifton; Joseph J. Sandler, Wayne; Marc L. Sandler, Livingston, and Frank Zabroski, Convent Station, all of N.J., assignors to Lawn King, Inc., Fairfield, N.J.

Filed July 9, 1975, Ser. No. 594,198
Int. Cl.² A01C 7/06
U.S. Cl. 239—656 **3 Claims**



1. Apparatus for treating lawns comprising a plurality of hoppers for dispensing predetermined amounts of seed or fertilizer, each of said hoppers including an opening for feeding material therefrom and means for adjusting each of said hopper feed openings, said adjusting means including:

sliding means including a stationary guide and a movable closure bar for sliding relative to said stationary guide between an open and closed position for adjusting the size of said hopper feed opening;

means for positively actuating said sliding means between said open and closed positions including a rack and pinion operatively connected to said movable closure bar; and

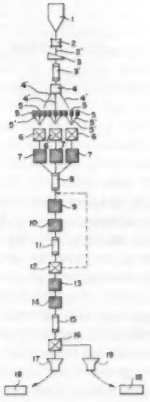
indicator means operatively connected to said actuating means for indicating the position of said sliding means relative to said hopper feed opening, said indicator means including an indicator dial and pointer, and a common shaft for mounting said pinion and said indicator dial.

3,974,968

PROCESS FOR THE MANUFACTURE OF SORGHUM FLOUR

Ing. Guillermo Ceballos-Aquilera, Escobedo Sur 733 Suite 201, Monterrey, Nuevo Leon, Mexico

Filed Dec. 26, 1974, Ser. No. 536,555
Int. Cl.² B02C 9/04
U.S. Cl. 241—11 **2 Claims**



1. A dry process of manufacturing sorghum flour in a system

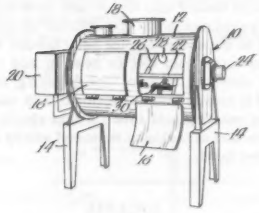
through which the sorghum is entered, transported and processed to produce flour comprising the steps of

1. entering raw sorghum into a receiving chute of said system,
2. weighing the raw sorghum before processing by transporting it through said chute to a scale,
3. passing the weighed raw sorghum through a duct to an aerating sieve for separating the shells from the raw sorghum as a first processing step,
4. transporting the cleaned sorghum through said system for processing,
5. polishing the cleaned sorghum cleaned in previous processing steps by submitting all surfaces to friction,
6. separating residue from the polished sorghum by a vacuum process,
7. breaking the cleaned sorghum with rolling pins,
8. sifting the broken sorghum to separate fine flour,
9. homegenizing the separated fine flour,
10. milling the homogenized fine flour, and
11. separating such milled fine flour into coarse and fine flour.

3,974,969
HIGH SPEED CHOPPER FOR PRECISION MIXERS

Clarence A. Herbst, Sr., Park Ridge, Ill., assignor to Resinoid Engineering Corporation, Skokie, Ill.

Filed Aug. 1, 1974, Ser. No. 493,549
Int. Cl.² B02C *13/00, 18/14*
U.S. Cl. 241—98 **14 Claims**

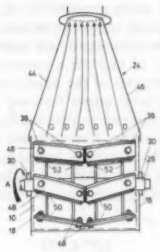


1. In a comminuting machine comprising: a drum, motor means mounted on the drum, a rotating rod means in said drum operatively connected to and driven by said motor means, and impeller means carried by the rod means for sweeping the internal area of the drum, in combination with rotating means projecting radially into the drum through a wall thereof in position to contact material swept by said impeller, said rotating means comprising a shaft, at least one blade member mounted on said shaft, said blade member having a pair of arms projecting radially outward from said shaft, each of said arms having a top forwardly facing impacting edge, a bottom forwardly facing impacting edge and at least one intermediate forwardly facing impacting edge between said top and bottom edges for contacting and disintegrating the material into smaller particle sizes and said top impacting edge, bottom impacting edge and at least one intermediate impacting edge on each of said arms lie in a plane disposed at an acute angle with respect to a top or a bottom surface of said arm.

3,974,970
FORAGE HARVESTER CUTTERHEAD

Raymond Bertrand; Jean Tenaud, and Rene Grabowski, all of Senonches, France, assignors to Deere & Company, Moline, Ill.

Filed Sept. 4, 1975, Ser. No. 610,309
Claims priority, application France, Oct. 16, 1974, 74.34747
Int. Cl.² B02C *18/18*
U.S. Cl. 241—222 **4 Claims**

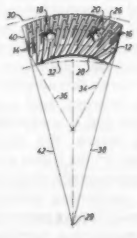


1. A cut-and-throw type forage harvester having a rotatable cutterhead with a plurality of knives mounted thereon and having cutting edges generating a cylinder as the cutterhead rotates, the cutterhead being mounted in a housing having generally upright side walls and an upwardly directed tangential outlet communicating with an upwardly extending discharge chute having converging side walls extending upwardly from the housing side walls to a narrowed outlet with a lesser width than the width of the cutterhead housing between the housing side walls, characterized in that the cutting edges of the knives diverge from a central portion of the cutterhead in the direction of cutterhead rotation so that crop material impelled by the knives in a direction perpendicular to the cutting edge through the housing outlet is converged toward a central portion of the discharge chute to reduce the impingement of the material on the converging side walls of the discharge chute.

3,974,971
GRINDING DISCS FOR DEFIBERING FIBROUS MATERIAL

Rolf Bertil Reinhall, Killingevagen 16, 181 64 Lidingo, Sweden

Continuation of Ser. No. 347,571, April 3, 1973, abandoned.
This application Mar. 6, 1975, Ser. No. 556,145
Claims priority, application Sweden, Apr. 13, 1972, 4819/72
Int. Cl.² B02C *13/20*
U.S. Cl. 241—261.3 **1 Claim**



1. A grinding disc for defibering fibrous material in an interspace between two opposed relatively rotating discs comprising:

a. a circular plate mounted for rotational movement;
b. an opening located at the center of said plate for introducing the material into a central feeding section;
c. a plurality of arcuate grinding segments having radially extending edges disposed peripherally about said plate and extending inwardly from the outer periphery of the segment to an inner periphery thereof which merges with said feeding section;
d. said grinding segments having a grinding face comprising a plurality of spaced ribs with intervening material flow channels extending obliquely from the inner periphery to the outer periphery of the segments; and
e. the outer and inner peripheries of said segments both having a radius of curvature which is shorter than the dimension of the spacing of said segment inner periphery from the center of said plate opening to cause the outer and inner peripheries of the adjoining segments to define scalloped peripheral edges forming a wave-shape about the disc circumference so that the two opposed relatively rotating discs subject fibrous material therebetween to radial forces which vary in frequency and magnitude in response to the wave-shape producing pulsating pressure variations resulting in improved defibration.

3,974,972

APPARATUS FOR FORMING A RESERVE WINDING ON A YARN SPOOL

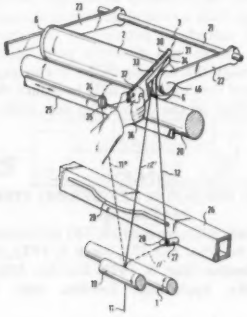
Emil Egli, Windisch, Switzerland, and Hans Landwehrkamp, Lenting, Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed June 26, 1974, Ser. No. 483,390

Claims priority, application Germany, June 26, 1973, 2332327

Int. Cl.² B65H *54/02*

U.S. Cl. 242—18 PW **7 Claims**



1. Apparatus for forming a reserve winding of thread from a supply source on a thread spool core having an end engageable with a core end supporting member carried by a spool holder and driven by a spool roller, such apparatus including thread-holding means adjacent to the path of thread between the supply source and the spool core and a frame having a working end which carries thread-gripping means for gripping a thread extending between said supply source and said thread-holding means and thread-cutting means adjacent to the thread-gripping means, the improvement comprising wedging means carried by the frame working end and movable into a position for temporarily wedging apart the spool core and the core end supporting member whereby a thread gripped by said thread-gripping means is inserted between said core and said core-supporting member, said wedging means being carried on the frame side adjacent to the spool core, and the cutting means being carried on the frame side opposite the spool core for severing a thread extending between said thread-gripping means and said thread-holding means.

3,974,973

DOFFING DEVICE FOR BOBBIN TUBES OR SPOOLS

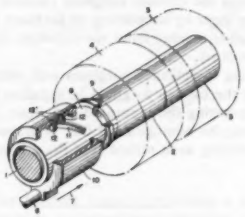
Erich Lenk, and Peter Illg, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Aug. 4, 1975, Ser. No. 601,795

Claims priority, application Germany, Aug. 9, 1974, 2834363

Int. Cl.² B65H *67/02*

U.S. Cl. 242—41 **8 Claims**



1. An ejector mechanism for ejecting winding tubes from cantilevered winding machine chucks having means for gripping the winding tubes, said means having members engaging the inner face of tube in tube-gripping position and releasing the tubes for removal thereof upon rotation of the tubes relative to the chuck in a tube-releasing direction of rotation, said mechanism comprising a chuck rotatably supported on a winding machine with its chuck shaft cantilevered on said machine, an ejector actuator contiguous to said shaft and adapted for linear movement of said ejector actuator parallel to said shaft, an ejector head with tube-engaging means thereon to engage an end of said tube when said head is moved by said acutator toward said end of said tube, and cam means operatively associated with said ejector actuator and said ejector head to move said ejector head toward a tube on said chuck and to rotate said ejector head in said tube-releasing direction of rotation, as said tube-engaging means of said ejector head is moved into engagement with said end of said tube, thereby rotating said tube on said chuck in said tube-releasing direction as said tube is pushed axially on said chuck by said ejector head.

3,974,974

BACK TENSION IMPARTING DEVICE

Tatsuo Nishikawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 8, 1974, Ser. No. 468,075

Claims priority, application Japan, May 15, 1973, 48-57196[U]

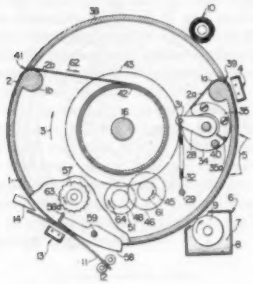
Int. Cl.² B65H *17/04, 23/06*

U.S. Cl. 242—55 **7 Claims**

1. A back tension imparting device for use in winding strip material comprising:
a. a take-up reel on which one end of said strip material is wound;
b. means for preventing rotation of said take-up reel in the direction in which the strip material wound thereon recoils;
c. means producing a driving force for driving the take-up reel to rotate in the direction in which the strip material is advanced and wound on the take-up reel;
d. a supply reel on which the other end of the strip material is wound and comprising a first rotatable shaft; and
e. means for urging the supply reel to rotate in a direction in which back tension is imparted to the strip material, said urging means comprising:
i. a second rotatable shaft disposed in alignment with said first rotatable shaft;

ii. means for connecting said first and second shafts for rotation as a unit, comprising a coil spring surrounding and tightly engaging said first and second shafts and having one end connected to said second shaft;

iii. means for applying a back tension force to said second shaft to urge it to rotate in a direction in which back tension is imparted to the strip material; and



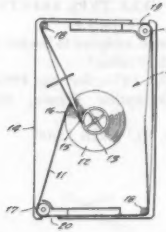
iv. means connected to the other end of said coil spring for loosening said coil spring when the driving force on said strip material from said driving means exceeds the back tension force on said second shaft to permit rotation of said first shaft with respect to said second shaft and against the frictional force applied by said coil spring.

3,974,975

DOUBLED-END CARTRIDGE TAPE

Dennis K. Holmes, Bluffton, Ind., assignor to Steve P. Double, Markle, Ind., a part interest

Filed Apr. 7, 1975, Ser. No. 566,030
Int. Cl.² B65H *17/48*
U.S. Cl. 242—55.19 A **7 Claims**



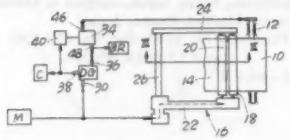
1. For use with a tape player which includes a tape cartridge receptacle having means therein for engaging said cartridge and magnetic pick-up means for transducing the intelligence on a magnetic tape, a double-end tape cartridge comprising a housing having substantially identical end portions dimensioned to be received selectively and individually in said receptacle, each said end portion including means cooperative with said engaging means for holding said housing within said receptacle, a window in each said end portion, a tape spool rotatably received within said housing, an endless ribbon of magnetic tape having front and back recording surfaces, said ribbon being wound on said spool and including a loop portion, means for guiding said loop portion past said windows, said pick-up means engaging said loop portion through a respective one of said windows when respective ones of said end portions are received in said receptacle, said tape including first means disposed between said windows for imparting a 180° twist to said tape in a first rotational direction, second means disposed between one of said windows and said spool for imparting a 180° twist to said tape in a rotational direction opposite said first rotational direction.

3,974,976

APPARATUS FOR SUPPRESSING ROTATIONAL FLUCTUATION OF SUPPLY ROLL

Hideo Mukai; Toshiaki Yamaguchi, both of Kyoto, and Tsuneo Yoshida, Tokyo, all of Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Filed June 24, 1974, Ser. No. 482,627
Claims priority, application Japan, June 26, 1973, 48-76275
Int. Cl.² B65H *23/20*
U.S. Cl. 242—75.5 **14 Claims**



1. Apparatus for controlling fluctuations in the rotational movement of a supply roll containing a length of web material while said material is being stripped away from said supply roll, where said material has adhesive provided on at least one of its sides, said apparatus comprising:

roll support means adapted to rotatably support said supply roll for allowing essentially free rotation thereof;

take-out means adapted to contact the periphery of said supply roll for removing said material from said supply roll, said take-out means including:

support means,

a peel-off roller rotatably mounted to said support means for contacting the periphery of said supply roll to strip said material from said supply roll and allow said material to become wrapped around a portion of the peripheral surface of said peel-off roller along the side of said material which faces outwardly of the supply roll axis when wound on said supply roll,

a take-off roller rotatably mounted to said support means for positioning generally away from said supply roll when said peel-off roller is in contact with said supply roll periphery to take out said material from said peel-off roller, to allow said material to become wrapped around a portion of the peripheral surface of said take-out roller along the side of said material facing inwardly of said supply roll axis when wound on said supply roll, and to deliver said material to a subsequent processing location,

means for maintaining said peel-off roll in pressure contact with the periphery of said supply roll, and

means for rotating said peel-off and take-out rollers generally at a substantially constant speed;

differential gear means having a first input shaft, a second input shaft and an output shaft, said output shaft adapted to rotate when said first and second input shafts rotate at different speeds;

drive means providing rotational drive substantially at said constant speed, said drive means being operatively coupled to said first input shaft of said differential gear means to provide a reference rotation thereto;

transmitting means coupled to said roll support means for transmitting rotation of said supply roll to said second input shaft of said differential gear means;

resistance means operatively coupled to said output shaft of said differential gear means for suppressing rotation of said output shaft, such that if the rotational speed of said second input shaft of the differential gear means is less than that of said first input shaft, said output shaft rotates

in a first direction, said first direction rotation of said output shaft being transmitted to said resistance means for suppression thereof to allow said rotation of said first input shaft to be transmitted via said second input shaft to said supply roll, and if the rotational speed of said second input shaft is greater than that of said first input shaft, said output shaft rotates in a second direction, opposite to said first direction, said second direction rotation of said output shaft being transmitted to said resistance means for suppression thereof to retard the increased rotational speed of said second input shaft and said roll support means.

3,974,977

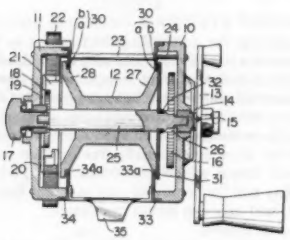
FISHING REEL

Kiyohide Kamikawa, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed May 28, 1974, Ser. No. 473,830

Int. Cl.² A01K *89/00*

U.S. Cl. 242—84.1 R **2 Claims**



1. A fishing reel comprising:

a. two opposite side plates which have bearings at the center thereof respectively and are fixed together with a plurality of tie rods, said side plates having a given spaced interval therebetween, at least one of said plates being provided with a gear-housing having a drag mechanism therein;

b. a spool shaft which is rotatably supported at both ends thereof with said bearings of the side plates, respectively;

c. a spool which is fixed to said spool shaft so as to be rotatable therewith between said side plates, said spool having at both axial ends thereof disc-like shaped flanges opposite to each other, said flanges being provided at an inner side of the outer periphery thereof with an annular notched portion respectively, said notched portion being formed of two faces which extend axially and radially with respect to said spool, respectively;

d. cover plates which are provided at the inside of said side plates, at least one of which cover plates has the gear-housing, said cover plates having at the center thereof a circular hole, respectively, said hole having a diameter smaller than the outer diameter of a corresponding one of the flanges, the inner periphery of said hole facing and spaced apart from the axial face of said notched portion and close to the radial face of the notched portion, wherein at least one of the flanges of said spool is formed of a separate member so that the spool may be inserted at one end thereof through the hole of one of said cover plates, said member being fixed to the spool after the one cover plate is assembled; and

e. a handle attached to one of said side plates and said spool shaft, said handle being turnable in association with said spool shaft so that the spool may be rotated.

3,974,978

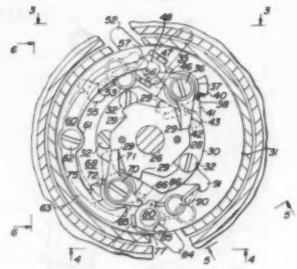
ANTI-REVERSE MECHANISM FOR FISHING REELS

Herbert O. Henze, Philadelphia, Pa., assignor to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed Aug. 21, 1975, Ser. No. 606,422

Int. Cl.² A01K *89/01*, *89/02*; F16D *63/00*; G05G *1/00*

U.S. Cl. 242—84.1 R **5 Claims**



1. Anti-reverse mechanism for fishing reels having a shaft contained in the reel housing attached to structure for winding and unwinding line from the reel, for restricting rotation of the structure to one direction for normal operation which includes

a toothed wheel attached to said shaft,

a plate extending from said housing adjacent said wheel,

at least two dogs rotatably mounted to said plate and normally resiliently urged into engagement with said wheel,

at least one of said dogs having spring means attached thereto to cause its engagement with said wheel to be silent,

at least one of said dogs causing an audible sound upon engagement with said wheel during rotation thereof, and

cam means associated with said dogs to provide for their selective disengagement from operating position with said wheel.

3,974,979

DEVICE FOR A BUCKLE TYPE SAFETY BELT FOR VEHICLE

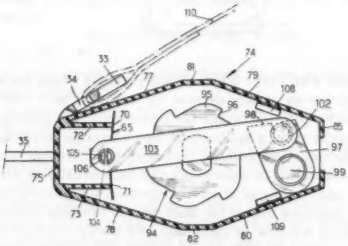
Walter Fieni, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 20, 1974, Ser. No. 499,031

Claims priority, application France, Aug. 21, 1973, 73.30302

Int. Cl.² A62B *35/00*

U.S. Cl. 242—107.4 R **6 Claims**



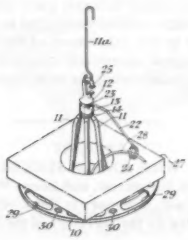
1. A device for a buckle type safety belt comprising a generally u-shaped frame member having opposed side walls connected by a forward wall, each of said sidewalls having a generally keyshaped opening comprising a first circular opening and a forwardly extending channel and a second circular

opening in its rearward portion, said forward wall having a third opening for receiving catch plate means having an aperture for engaging external buckle means, lug means slidably mounted in each of said forwardly extending channels, said catch plate means having a forward end portion extending outwardly of said frame member through said third opening and a rearward end portion slidably mounted in said channels and adapted to engage said lug means, first spindle means rotatably mounted in and supported by each of said first circular openings, and adapted to carry a strap member, second spindle means rotatably mounted in and supported by said second circular openings, ratchet wheel means mounted on said second spindle means, pawl means rotatably mounted on said second spindle means, lever means connecting said lug means and said pawl means, and wherein forward sliding movement of said lug means causes said lever means to rotate said pawl means into locking engagement with said ratchet wheel means and rearward sliding movement of said lug means causes said lever means to rotate said pawl means into non-locking position, wherein said pawl means does not engage said ratchet wheel means, said first spindle means being spring-biased to urge said pawl means and said ratchet wheel means into locking engagement.

3,974,980
WIRE DISPENSING DEVICE

William B. Marcell, Fort Lauderdale, Fla., assignor to Jet Line Products, Inc., Matthews, N.C.

Filed Dec. 30, 1974, Ser. No. 537,554
Int. Cl.² B65H *49/00*
U.S. Cl. 242—128 **8 Claims**



1. In a fixture for unwinding coiled wire, including, as a part of the combination, rotatable hanging means, a plate and flexible suspending lines between the plate and rotatable hanging means, that improvement in the rotatable hanging means which comprises as elements

a base;

an axle fixed to the base;

a rotatable disc mounted on said axle to which disc the suspending lines are attached;

a series of ball-receiving depressions on the inner face of said disc;

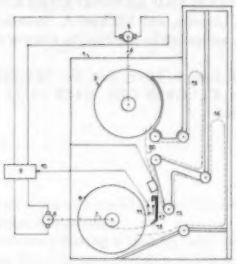
a single ball-receiving depression in the face of said base, the axis whereof is indexed with the axes of the depressions in the rotatable disc; and

a spring-driven ball seated in the depression in said base, sequentially engaging said depressions in said disc as the disc is rotated.

3,974,981
AUTOMATICALLY OPERATED MAGNETIC TAPE EQUIPMENT

Jacques Paul Stiegler, Villepreux, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Sept. 30, 1974, Ser. No. 510,166
Claims priority, application France, Oct. 1, 1973, 73.34986
Int. Cl.² G11B *15/58, 23/12*
U.S. Cl. 242—182 **6 Claims**



1. A magnetic tape equipment comprising:

a. a casing;

b. a first chamber in said casing;

c. a tape supply spool in said first chamber;

d. a second chamber in said casing;

e. a tape receiver spool in said second chamber;

f. a duct in said casing connecting said first chamber to said second chamber for the travel of the tape between said spools;

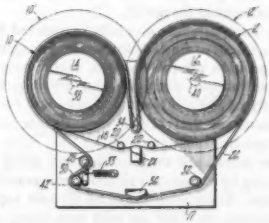
g. said duct comprising an end wall portion an edge of which also constitutes an edge of said second chamber and against which the tape is applied when stretched between said supply and receiver spools,

wherein said end wall portion comprises a plate inwardly tiltable to said second chamber when pressed by the stretched tape.

3,974,982
TAPE TRANSPORT

Robert L. Stone, Portland, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Feb. 24, 1975, Ser. No. 552,303
Int. Cl.² G03B *1/04*; G11B *15/32*
U.S. Cl. 242—192 **6 Claims**



1. A tape transport for minimizing spillage of the tape from the hubs and disengagement of the drive belt from the tape on the hubs, the tape transport including:

a base for mounting tape transport elements;

a pair of hubs rotatably mounted on said base for transferring tape therebetween, each of said hubs having an outer convex annular surface for receiving tape whereby tape on said hubs assumes a convex curved surface;

drive belt means for driving said hubs to transfer tape between said hubs; and

a plurality of idler means rotatably mounted on said base, each of said idler means having an outer convex surface;

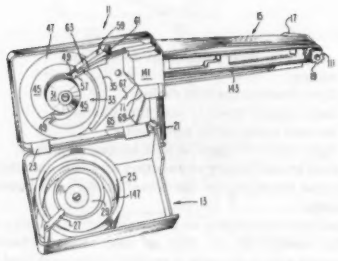
said drive belt means being in contact with said convex surfaces of said idler means and with the convex curved surface of tape on said hubs.

3,974,983

TAPE FEED AND REWIND CARTRIDGE

Louis R. Brown, Livonia, and Michael A. Saunders, Westland, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 9, 1975, Ser. No. 585,320
Int. Cl.² G03B 1/04; G11B 15/32
U.S. Cl. 242—194 33 Claims



1. A tape cartridge adapted for coupling with a tape reader and effective for feedably advancing and windably regathering double-ended information-bearing tapes of various lengths thereto and therefrom, said tape cartridge comprising:

a. an enclosed elongated tape transport guideway by means of which said cartridge is adapted for coupling with said tape reader,

b. a rewind compartment integrally formed with said enclosed transport guideway and disposed in communicating relationship therewith,

a supply compartment pivotally connected to said rewind compartment to form a closed and an angularly displaced open position relative thereto, said supply compartment when in its open position being effective for receiving a helically coiled double-ended tape and for disposing the innermost end thereof in communicable relationship with said tape transport guideway,

d. one or more read stations disposed along said transport guideway by means of which the information recorded on said tape is rendered readable by said tape reader, said information recorded on said tape being codably represented by apertures formed therein,

e. rewind apparatus disposed within said rewind compartment and effective for windably regathering a feedably advanced tape in reusable and re-feedable form, and

f. drive means associated with said rewind apparatus and responsive to said tape reader to feedably advance a tape received within said supply compartment along said transport guideway and past said read station to the control of said rewind apparatus.

3,974,984

CONTROL OF GUIDED MISSILES

Geoffrey Townsend Dobson, and Sidney George Chamberlain, both of Heston, England, assignors to British Aircraft Corporation, London, England

Filed Mar. 23, 1962, Ser. No. 183,007
Claims priority, application United Kingdom, Mar. 24, 1961, 10943/61
Int. Cl.² F41G 7/00, 7/14
U.S. Cl. 244—3.11 1 Claim

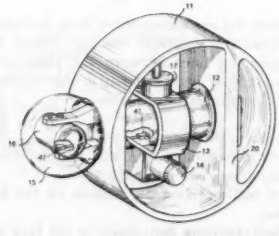
1. A visual aimer for use in the control of a guided missile comprising in combination, computer means for generating course correcting signals for the missile before and during flight, means transmitting the correcting signals to the missile, a first manual control coupled to said means to effect a first mode of course correction in the missile, a rotatable optical sight having a hand grip for rotating the sight about a vertical axis in aiming the sight at a target, an angular datum pivot member for said sight positioned along said vertical axis and including means to hold the pivot member stationary against rotation with said sight, a rotary potentiometer having relatively movable parts respectively coupled to the datum member and rotatable sight, connections to the computer from the potentiometer to signal the relative angular displacement of the datum member and the sight to said computer means, and means in the computer to effect a further mode of course correction in the missile before launching to cause it to follow an initial launching course designated by the corresponding positions of said relatively movable parts and a further adjustable manual electrical control connected to the computer and means responsive to the adjustment of the latter to generate a compensating signal operatively connected to compensate for the lateral displacement of the sight from the actual line of flight of the missile.

3,974,985

WIDE ANGLE SEEKER

John M. Campbell, Ridgecrest, and James W. Oestreich, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 18, 1972, Ser. No. 254,721
Int. Cl.² F41G 7/00; F42B 15/02
U.S. Cl. 244—3.16 4 Claims



1. A tracker mounted on a body having a longitudinal axis; said body having an opening therein on an axis perpendicular to said longitudinal axis;

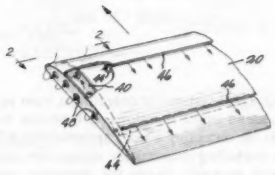
said body having a cross section and a dimension related to the cross section;
said tracker comprising:
a turret rotatably mounted in said opening for rotation about the axis perpendicular to said longitudinal axis of said body;
a lens barrel rotatably mounted at one end of said turret so that said barrel is completely outside said opening in the body;
said lens barrel being rotatable about an axis perpendicular to said axis of said opening;
an auxiliary gimbal pivotally attached to said turret in said body;
means for pivoting said auxiliary gimbal about an axis;
a pushrod having first and second ends, pivotally attached on said first end to said auxiliary gimbal at a location spaced from said gimbal pivot axis, and pivotally attached on said second end to said lens barrel at a location spaced from said lens barrel rotation axis;
a lens system contained in said lens barrel; and
sensing means located within said turret in said body in a manner whereby said sensing means rotates when said turret rotates and receives images from said lens system.

3,974,986

AIRCRAFT WING VORTEX DEFLECTOR

Edmund H. Johnstone, 82 Salzburg Blvd. Apt. G, Columbus, Ind. 47201

Continuation-in-part of Ser. No. 364,685, May 29, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,531
Int. Cl.² B64C *21/02*
U.S. Cl. 244—40 R **2 Claims**



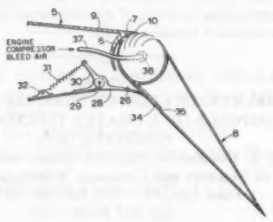
1. In an aircraft, in combination, wings each having a continuous uninterrupted leading edge and a tip portion, each wing producing a lifting airfoil reaction during flight and each tip portion being characterized by flow of air therearound in a spiral path defining vortices in the wake of the wing tip during flight, and deflector means located at the tip portion of each wing and effective to intercept and receive at least a part of the vortex-tending air flow as it occurs at the wing tip during flight and divert the received air flow rearwardly of the direction of flight, said deflector means being confined within the wing and including a chamber within the tip portion of each wing, said chamber being elongated substantially in the direction of flight, air inlet means at each wing tip portion rearwardly of said leading edge occurring along the length of and communicating with said chamber, said inlet means being located below the top surface of the wing to intercept and receive some of said air vortices occurring at each wing tip, and air outlet means at each wing communicating with said chamber and discharging rearwardly during flight, said deflector means functioning to intercept some air from said air vortices for flow through said inlet means and chamber for discharge at said outlet means only in response to the angular momentum and velocity of said wing tip vortices occurring at each wing tip and to the flow of air over each wing during flight.

3,974,987

CASCADE EFFECT BLOWN FLAP

Melvin Shorr, Marina del Rey, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed May 7, 1975, Ser. No. 575,163
Int. Cl.² B64C *21/04*
U.S. Cl. 244—42 CC **2 Claims**



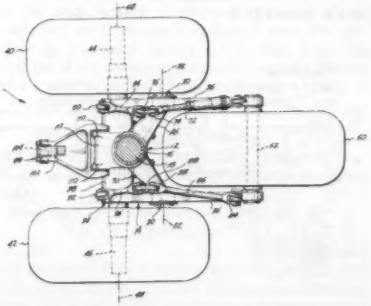
1. An aircraft wing and trailing edge cascade-effect blowing flap combination comprising:
a. an aircraft wing having a trailing edge adapted to mount a blowing flap within a sealable recess provided therein, said flap being deflectable downwardly from a neutral position relative to said wing to a deflection angle substantially greater than 60° thereto,
b. means connecting the interior of said flap to a source of high pressure air,
c. a plurality of blowing means in said flap operable to blow a cascade of high pressure air from the interior of said flap rearwardly over the upper surface thereof, and arranged in series to incrementally increase the volume of said high pressure air as said flap is deflected from said neutral position to said deflection angle greater than 60°, and an additional blowing slot in the trailing edge thereof between upper and lower springy, preloaded surface skins terminating in a normally closed slot, said slot being operable to open when the high pressure air in said flap exceeds a predetermined value, to blow said high pressure air therethrough to define a jet flap.

3,974,988

THREE-WHEEL LANDING GEAR ASSEMBLY

Samuel Whitworth, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 23, 1974, Ser. No. 535,848
Int. Cl.² B64C *25/36*
U.S. Cl. 244—103 R **14 Claims**



1. A three-wheeled aircraft landing gear assembly comprising a shock strut having a lower end and a truck depending from the lower end of the strut; the truck having a forward end and an aft end and comprising a rigid, generally U-shaped

frame including two side beams spaced apart on opposite sides of the strut and an end beam extending between and interconnecting the forward ends of the side beams; two substantially coaxial forward wheels mounted outboard of and on opposite sides of the forward end of said frame; an aft wheel and means mounting the wheel between aft ends of the side beams; and connection means connecting the lower end of the strut to each of the side beams at locations between the rotational axes of the forward wheels and the aft wheel, the connection means permitting rotation of the side beams in vertical planes about a common rotational axis.

3,974,989

INFLATABLE LIGHTER-THAN-AIR ARTICLE COMPOSED OF A COATED TRIAXIAL WEAVE CONSTRUCTION

Kenneth A. Goodfellow, Fairfield, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1975, Ser. No. 567,016
Int. Cl.² B64B *1/14*
U.S. Cl. 244—126 **4 Claims**

1. In an improved lighter-than-air article comprised of lighter-than-air gas and a covering to contain the gas, the improvement consisting of a covering which is a coated triaxial weave fabric consisting essentially of

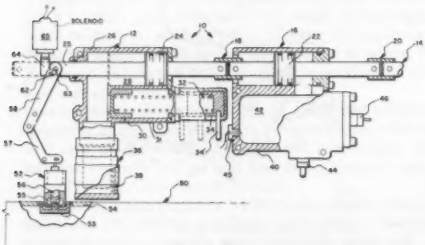
a. a triaxial weave fabric
consisting of fibers wherein said fibers are polyester, polyamide, or aromatic aramide, and
weighing less than 2 ounces per square yard;
b. a heat-sealable polymeric film firmly adhered to one side of the triaxial weave fabric,
said heat-sealable polymeric film being polyether urethane, polyester urethane, polyvinyl chloride, or chlorosulfonated polyethylene; and
c. a gas-impermeable film firmly adhered to the other side of the triaxial weave fabric,
said gas-impermeable film being polyvinyl fluoride, polyethylene terephthalate, or polyvinylidene chloride; and
the coated triaxial weave fabric having
a thickness of 6 to 10 mils,
a tensile strength measured at the weakest direction according to ASTM-D-751 of at least 300 pounds, and
a tear strength measured by ASTM-D-751 of at least 25 pounds.

3,974,990

DUAL EJECTOR STORES ATTITUDE CONTROL SYSTEM

Lloyd J. Holt, and Clayton Panlaqui, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 21, 1975, Ser. No. 597,869
Int. Cl.² B64D *1/04*
U.S. Cl. 244—137 R **7 Claims**



1. An apparatus adapted to be attached to an aircraft for carrying and forcibly ejecting a store which has means thereon for releasable attachment to said apparatus comprising in combination,

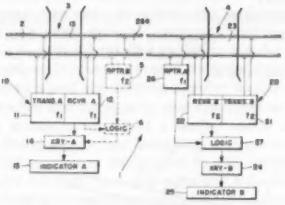
gripper means for releasably securing the store,
a source of pressurized fluid,
cylinder means communicating directly with the source of pressurized fluid,
a power piston slidably positioned within said cylinder and having a pair of oppositely extended power shafts integral and coaxial therewith,
first and second fluid motor means each comprising a fluid pressure cylinder and an actuator piston slidably positioned therein and having oppositely extending actuator shafts and one of said actuator shafts of each fluid motor means being respectively attached to one of said oppositely extending power shafts,
an ejector cylinder communicating directly with said fluid pressure cylinder in each fluid motor means, and
at least one hollow ejector piston slidably positioned within each said ejector cylinder.

3,974,991

RAILROAD MOTION DETECTING AND SIGNALLING SYSTEM WITH REPEATER RECEIVER

Willard L. Geiger, Chagrin Falls, Ohio, assignor to Erico Rail Products Company, Solon, Ohio

Filed Aug. 27, 1975, Ser. No. 608,085
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 CT **18 Claims**



1. A railroad signal system for detecting a train approaching at least two spaced apart locations, comprising transmitter-receiver means for detecting a train approaching a first one of the locations, including transmitter means for developing a first signal, and receiver means for detecting such an approaching train in response to changes in such first signal representative of the approaching train speed and distance from such first location; and repeater receiver means between such locations for looking through such first location even under unfavorable ballast conditions for detecting such an approaching train in response to changes in such first signal representative of the approaching train speed and distance from a subsequent one of the locations.

3,974,992

VEHICLE VELOCITY LIMIT CONTROL METHOD AND APPARATUS

Thomas C. Matty, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

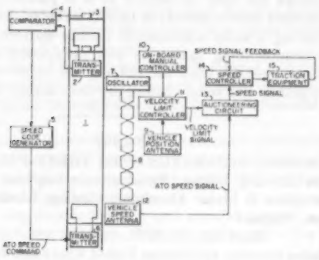
Filed Mar. 13, 1975, Ser. No. 558,106
Int. Cl.² B61L *3/12*
U.S. Cl. 246—182 B **18 Claims**

1. In a speed control apparatus for a vehicle operative with a pathway, including at least one vehicle pathway zone in which the movement speed of said vehicle is to be controlled, the combination of:

first means for providing a first signal in accordance with the movement of said vehicle within said vehicle pathway zone;
second means responsive to said first signal for establishing a predetermined distance magnitude for said vehicle pathway zone;

third means responsive to said first signal and said distance magnitude for determining the portion of said vehicle pathway zone which said vehicle has not traversed;

means responsive to said first signal and operative with said third means for providing a predetermined speed limiting



control signal operative to control the speed of said vehicle in said zone;

means for providing a second signal in relation to said vehicle pathway zone; and

means responsive to said second signal for providing information to said second means.

3,974,993

RAILWAY TRACK SWITCH HEATING ARRANGEMENT

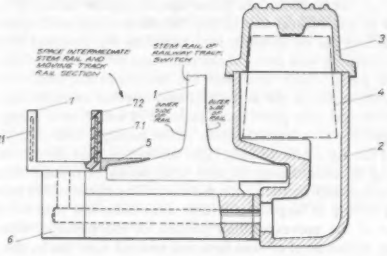
Michael Hammecke, Darmstadt-Eberstadt, Germany, assignor to Eltra KG Leicht & Trambauer, Pfungstadt, Germany

Filed June 9, 1975, Ser. No. 585,295

Claims priority, application Germany, June 10, 1974, 2427864

Int. Cl.² E01B 7/24

U.S. Cl. 246—428 **15 Claims**



1. In combination with a railway track switch, an arrangement for preventing the accumulation on the track switch of snow such as could cause blockage of a moving part of the track switch or other malfunction of the track switch, comprising, controllable track switch heating means operative when activated for heating at least one of the track rail sections of said track switch; capacitive snow-detecting means including a capacitor having a pair of electrodes arranged spaced from each other in proximity to said track switch and having a capacitance which is a function of the height of the snow between said electrodes, means for determining and indicating the height of the snow accumulated between said electrodes by detecting the effect of the accumulated snow upon the capacitance of said capacitor and generating a snow-height-indicating electrical signal, means connected to said track switch heating means and connected to receive said snow-height-indicating electrical signal and automatically operative for controlling the operation of said track switch heating means in dependence upon said snow-height-indicating electrical signal, and heat conductor means connected between the heated track rail section and the vicinity of said electrodes for effecting a heating of the snow between said electrodes in correspondence to the heating of said at least one of the track rail sections, whereby as the track rail section is heated and the adjoining snow melts the snow accumulated between said electrodes of said capacitor will likewise melt and the height of snow between said electrodes accordingly decrease.

3,974,994

UNIVERSALLY ADJUSTABLE HOUSING APPARATUS

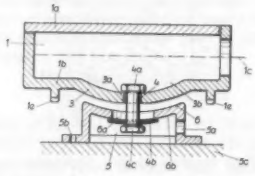
Carl Petterson, Vasteras, Sweden, assignor to Rema Electronic Ltd., Vasteras, Sweden

Filed Nov. 27, 1974, Ser. No. 527,862

Claims priority, application Sweden, Nov. 28, 1973, 7316044

Int. Cl.² F16F 15/00; F16M 11/14

U.S. Cl. 248—23 **6 Claims**



1. Apparatus comprising a hollow housing having a top wall, a front wall, a bottom wall and side-walls and adapted for containing a device having a functional axis, a socket means for supporting said housing for universal adjustment and locking means for securing the housing and socket means in adjusted position comprising a fastener bolt with a nut threaded thereon, at least one of said walls other than the front wall being planar, said one planar wall and said socket means having respective mating surfaces in the form of spherical segments, the mating surface on the housing being convex outwards and the mating surface on the socket means being concave inwards, said fastener bolt protruding centrally from the convex mating surface at right angles thereto, the concave mating surface having a circular opening the periphery of which is concentric with the periphery of the respective spherical segment surface, said fastener bolt passing with radial clearance through said concentric opening to enable adjustment of the relative position of the housing and socket means in equal extent in all directions, and retaining means larger in diameter than said concentric opening bearing in locked position against the back surface of the socket means at said concentric opening, said housing including at least one outwardly projecting protrusion having a free edge extending beyond the vertex of the convex mating surface on the housing for alternative stable mounting of the housing on a base.

3,974,995

MEANS FOR FORMING A BUILDING FACADE

Guy Blonde, 56, avenue Aristide Briand, 95530 La Frette sur Seine, France

Filed Aug. 26, 1974, Ser. No. 500,629

Int. Cl.² E04G 13/06

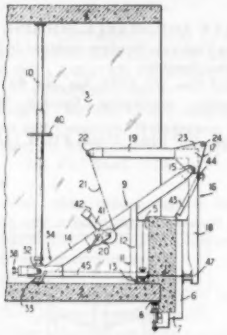
U.S. Cl. 249—19 **10 Claims**

1. In a wall shuttering for forming in situ from poured concrete a portion of an outside wall of a building, a scaffolding supporting and adjusting shuttering elements forming a mold for the poured concrete, said scaffolding comprising:

a. at least two spaced brackets, said brackets extending from within the building outwardly of the building wall, when the shuttering is assembled in place preparatory to pouring concrete,

b. each said bracket comprising a right-angled frame, each frame having vertical and horizontal sides and a hypotenuse, wherein

1. the vertical side of the frame supports an inner shuttering mold element at a location adjacent the inside of a portion of the wall to be formed.
2. the horizontal side extends inwardly from a lower portion of the vertical side.
3. and the hypotenuse extends beyond the vertical side outwardly of the building wall, when the shuttering is



assembled, and supports outer shuttering mold elements,

c. a prop for each bracket,

d. a pivot connecting the inner end of each bracket with its prop,

e. adjustment means connected to each bracket for adjusting selectively the vertical location of the scaffolding, and

f. adjustment means mounted on each bracket for adjusting selectively the horizontal location of the scaffolding.

3,974,996

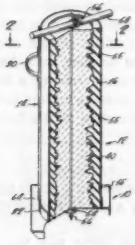
CANDLE MOLD

John L. Violet, Fallbrook, Calif., assignor to General Craft Supplies, Fallbrook, Calif.

Filed Dec. 16, 1974, Ser. No. 532,839

Int. Cl.² B28B *7/36*

U.S. Cl. 249—112 **7 Claims**



1. A mold for making articles having a three dimensional pattern on an external surface thereof, said mold comprising

a mold shell having an interior surface defining an outer mold cavity, said shell including means for relatively displacing parts of the shell to enable detachment of the shell from the contents of said outer mold cavity,

a resiliently and elastically deformable liner within said cavity, said liner comprising a hollow sleeve having an exterior surface adapted to mate in close juxtaposition to the interior surface of said shell and having an inner surface formed with a three dimensional pattern defining an inner mold cavity, said liner having a longitudinal slit extending entirely through the liner from one end thereof to the other to define contiguous mating edges, said liner being formed of a stretchable elastomeric material that allows the liner to stretch as it is pulled away from a molded article thereby to facilitate release from an article having a three dimensional surface pattern, and means circumscribing said liner and interposed between the liner and the shell for holding the sides of the sleeve together and snugly fitting the liner within the shell.

3,974,997

CASTING APPARATUS WITH THREE-PART CORE

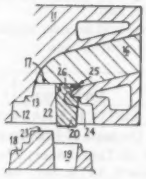
Albert Edward Bolton, Birmingham, England, assignor to Aeroplane & Motor Aluminium Castings Limited, Birmingham, England

Filed Apr. 1, 1974, Ser. No. 456,747

Claims priority, application United Kingdom, Apr. 18, 1973, 18811/73

Int. Cl.² B22D *15/00*; **B28B** *7/18*

U.S. Cl. 249—142 **6 Claims**



1. Apparatus for producing a metal casting having an internal passage including a curved portion and a straight portion meeting said curved portion, the width of the straight portion being not substantially greater than the width of the curved portion measured in the plane containing the radius of curvature of the central axis of the curved portion, said apparatus including die or mould means to define the external shape of said casting, and core means including first, second and third core parts which abut but are unconnected, and when in abutment define the surface of said internal passage, said first and second core parts being capable of withdrawal along their respective axes from the ends of the passage, said second core part having a hole passing right through it, said third core part being accommodated in said hole, being of metal, being arranged to define the inside portion of the curve of the passage, and having its largest transverse dimension less than the diameter of the corresponding portion of the passage, whereby, after withdrawal of said first and second core parts, the third core part may be removed with an initial inward movement towards the centre of the passage, the core parts being dimensioned and arranged to abut one another so that a face on the first core part is in contact with a face on the second and third core parts to define a joint line positioned so that the impression of the joint line cast on the metal surface of the curved passage lies on surfaces of revolution accessible from the ends of the passage.

3,974,998

SPRAY COATING APPARATUS

Lee A. Wood, Feasterville, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Continuation of Ser. No. 275,904, July 28, 1972, abandoned. This application July 9, 1974, Ser. No. 486,876

Int. Cl.² F16K *31/10*

U.S. Cl. 251—76 **12 Claims**

1. A valve unit for use in assembly line spray apparatus requiring rapid actuation and deactuation comprising:

a valve housing having fluid inlet means and fluid outlet means communicating with said inlet means and further having a cavity in fluid communication with said inlet means and said outlet means, said cavity including a cylindrical portion having a closed axial face, said face having an annular groove formed therein;

a resilient valve seat within said valve housing having an orifice through which fluid may flow from said inlet means to said oulet means;

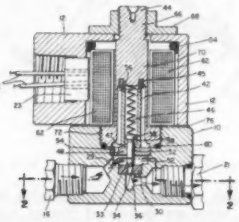
a plunger aligned for and having a chamfered end disposed to close said valve seat orifice, said plunger having a head;

a plunger guide for stabilizing said plunger within said valve housing;

spring means extending between the area surrounded by said annular groove and the head of said plunger for biasing said plunger to a closed position to pressure seal the orifice of said valve seat;

a copper ring disposed within said annular groove;

electromagnetic coil means disposed within said valve housing; and



an unrestrained magnetic armature free of spring biasing influence disposed within said valve housing cavity, said armature having an annular portion surrounding one end of said spring and terminating in an annular shoulder having a smaller inside and outside diameter than does said annular groove, and having a base portion which rests on said plunger guide when in an unactuated position and which is aligned to impact with said plunger head, there being a gap between said plunger head and said armature shoulder when said plunger is in a closed position such that upon energization of said coil, said armature base portion travels through the gap and impacts against said plunger head causing said plunger to overcome the fluid pressure and the bias of said spring to unseat and thereby open said orifice, said armature functioning without influencing lateral movement of said plunger, said armature seating upon said copper ring when in an actuated position.

3,974,999

COMBINED STAPLE REMOVING AND RETRIEVING DEVICE

Carol F. Bertolet, 613 S. Kenmore St., Anaheim, Calif. 92804

Filed Sept. 3, 1974, Ser. No. 502,273

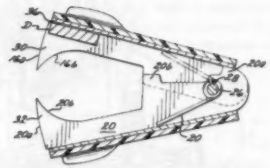
Int. Cl.² B25C *11/00*

U.S. Cl. 254—28 **3 Claims**

1. A staple removing and retrieving device, comprising:

a. first and second elongate ferrous members of channel shaped transverse cross sections that have first overlapping pivotally connected end portions and second end portions that define first and second pairs of claws, said first and second claws having inwardly disposed first and second concave edges, said second concave edges being insertable beneath the crown portion of a staple when said first and second claws and first and second members are in a first position in which said first and second claws are spaced from one another, said first concave edges moving under said crown to remove said staple when said first and second members and first and second claws move towards a second position in which said first and second jaws overlap;

b. a permanent magnet of such size as to be disposed within the confines of said first member adjacent said first pair of jaws; and



c. means for holding said permanent magnet within said first member to permit said magnet to magnetize said first pair of jaws to cause said staples to removably adhere to said first pair of jaws when said first and second elongate members and first and second pairs of jaws pivot from said second to said first position.

3,975,000

PREFABRICATED BALUSTRADE WITH MEANS FOR CONNECTION OF BALUSTERS TO A RAIL

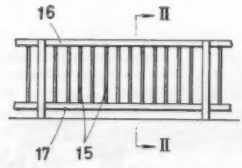
Yukio Sado, Asahimachi, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 11, 1974, Ser. No. 514,136

Claims priority, application Japan, Oct. 12, 1973, 48-119150[U]

Int. Cl.² B01F *13/00;* **B25G** *3/00*

U.S. Cl. 256—59 **11 Claims**



1. A balustrade comprising, in combination, a series of balusters, a rail to which said balusters are to be connected at longitudinal spacings each at one end thereof, said rail including a baluster mounting plate structure having a longitudinally extending aperture defined by a pair of spaced-apart longitudinal edges, said baluster mounting plate structure also having a series of longitudinally spaced transversely extending recesses which are open to said aperture, said recesses each having a shape to receive the end portions of said balusters respectively, a filler plate disposed to engage said spaced-apart edges for closing said aperture, and means including engageable male and female parts for locking said balusters in position in said recesses respectively.

3,975,001

APPARATUS FOR MIXING FLUIDS HELD IN TUBES

Robert R. Moore, Glenview, and Vincent E. Eltzen, Evanston, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

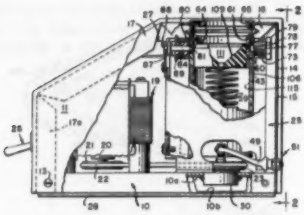
Filed Oct. 19, 1973, Ser. No. 407,809

Int. Cl.² B01F *9/02*

U.S. Cl. 259—72 **16 Claims**

6. Apparatus for providing stirring motion to a container of fluid material comprising: a tubular housing; means for mounting the upper portion of said housing while permitting rotary motion of the lower portion of said housing; drive

means for driving the lower portion of said housing in rotary motion; receptacle means slidably received in said housing and resiliently urged to a predetermined position therein, said receptacle means adapted to receive said container; and switch means responsive to the position of said receptacle



means within said housing for energizing said drive means when said receptacle means is displaced from said upper position by urging said container thereagainst, thereby to impart a stirring motion to a container held by said receptacle means.

3,975,002

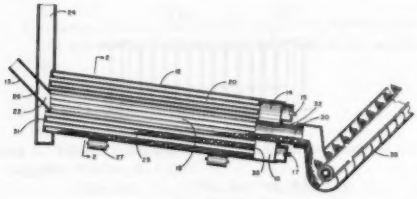
PROCESS AND APPARATUS FOR RECYCLE OF ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102

Division of Ser. No. 286,613, Sept. 5, 1972. This application July 12, 1974, Ser. No. 487,911

Int. Cl.² B28C *5/00*

U.S. Cl. 259—148 **3 Claims**



1. In a process for treating asphalt-aggregate compositions by mixing and heating the composition in an elongated tilted rotatable cylindrical drum having an input end and an opposite output end and a plurality of pipes extending along the length of the drum interior and means for providing hot gases of combustion to the pipes, the improvement of recycling used asphalt-aggregate compositions comprising:

introducing said composition comprising asphalt and aggregate in said drum at the input end, mixing and gradually heating said composition to a temperature above 225°F by rotating said drum while supplying said hot gas into said pipes and exposing said composition to said pipes and out of direct contact with said hot gas while said composition is advanced gravitationally along said drum toward the output end, and recovering the heated composition at the output drum end.

3,975,003

TORCH TYPE PIPE CUTTER

Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

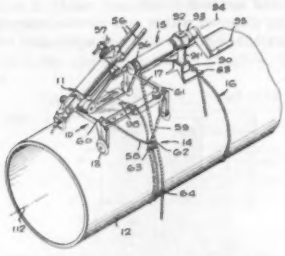
Filed Nov. 19, 1973, Ser. No. 417,249

Int. Cl.² B23K *7/04, 7/10*

U.S. Cl. 266—56 **16 Claims**

1. A pipe cutter including a carriage for carrying a torch circumferentially about the pipe, said carriage including two body sections, two sets of wheels on said body sections respectively for rolling about the surface of the pipe, and means interconnecting said two sections for relative adjusting movement of different relative positions in which said two sets of wheels are spaced different distances apart axially of the pipe.

6. A pipe cutter including a carriage for carrying a torch and having wheels which roll circumferentially about the outer surface of a pipe to form a circumferential cut therein, and an elongated chain encircling said pipe with each end thereof connected to said carriage for controlling the positioning and movement of said carriage relative to said pipe and having a series of identical links each formed by doubling back a single piece of material to form a return bend and two arms projecting in generally parallel relation therefrom, with said arms containing apertures through which the return bend of the



next successive link extends, said chain having an end link in which said two arms are deformed farther apart than the corresponding arms of other links of the chain and are receivable in a recess or opening in said carriage in frictional retaining relation.

8. A pipe cutter comprising:

a carriage adapted to carry a torch circumferentially about a pipe;

an actuating unit to be mounted at a fixed location on the pipe; and

an element extending from said actuating unit to said carriage and acting to advance the carriage about the pipe;

said element being an elongated flexible element extending about said pipe and exerting a pulling force on the carriage for advancing it circularly about the pipe.

3,975,004

VACUUM DEGASSING APPARATUS

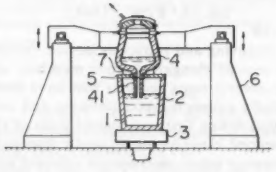
Masaru Okada, Nara, and Jun Inoue, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed July 8, 1975, Ser. No. 594,079

Claims priority, application Japan, July 15, 1974, 49-81575

Int. Cl.² C21C *7/10*

U.S. Cl. 266—210 **5 Claims**



1. An improved vacuum degassing apparatus for degassing molten steel in a vacuum vessel by flowing the molten steel between a ladle and the vacuum vessel through a tube, the improvement comprising:

a cover having an opening for receiving said tube therethrough and removably mountable on the top of said ladle;

a raising and lowering support provided with a mechanism for supporting said vacuum vessel and raising and lowering the same; and

a mechanism provided with a winch drive unit mounted on said raising and lowering support and connected with said cover through ropes or chains, for mounting and demounting said cover to and from said ladle.

3,975,005

VEHICLE SUSPENSION SPRING

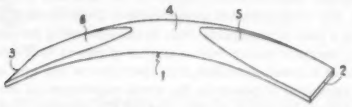
Michel Leon Duchemin, Douai, France, assignor to Ressorts du Nord S.A., Paris, France

Filed Mar. 19, 1975, Ser. No. 559,784

Claims priority, application France, Mar. 27, 1974, 74.10654

Int. Cl.² F16F 1/18

U.S. Cl. 267—47 **8 Claims**



1. A spring leaf for a vehicle suspension and extending in a substantially curvilinear direction from an end of the leaf to an opposite end of the leaf in a plane, said leaf being a modified solid roundsectioned bar which is flattened to taper progressively from a substantially centre bar portion of round section in the direction of said ends of the leaf, portions of the bar defining said two ends of the leaf having a substantially rectangular cross-sectional shape, the longer sides of said rectangular cross-sectional shape being substantially perpendicular to said plane and having a dimension exceeding the diameter of said centre bar portion.

3,975,006

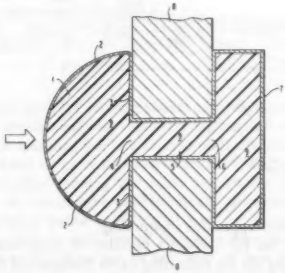
IMPACT KINETIC ENERGY ABSORBER

Gerald H. Peterson, 901 Sherman, Apt. 518, Denver, Colo. 80203

Continuation of Ser. No. 356,247, May 1, 1973, and a continuation of Ser. No. 433,612, Jan. 15, 1974, which is a continuation of Ser. No. 248,236, April 27, 1972. This application Jan. 17, 1975, Ser. No. 542,131

Int. Cl.² F16F 7/12

U.S. Cl. 267—139 **8 Claims**



1. In a device for absorbing kinetic energy of impact in which kinetic energy is absorbed by forcing plastic material to be extruded through an orifice, the combination of a first container filled with plastic material, a second container, and an extrusion orifice between and interconnecting said first and second containers, said first container having a movable wall for extrusion of said plastic material from said first container and through said extrusion orifice and into said second container on impingement of an impact force against said movable wall, said second container being filled with a normally solid plastic material which is compressible on extrusion of said plastic material from said first container into said second container and is expansible upon abatement of impact force impingement against said movable wall of said first container to thereby extrude the plastic material received therein from said first container back through said extrusion orifice and back into said first container in a manner to substantially return said movable wall to its original position.

3,975,007

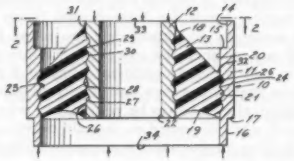
RESILIENT MOUNTING STRUCTURE

William J. Chorkey, Farmington, Mich., assignor to Ace Controls, Inc., Farmington, Mich.

Filed May 20, 1974, Ser. No. 471,566

Int. Cl.² F16F 3/08

U.S. Cl. 267—152 **7 Claims**



1. A shock absorber comprising:

a. a resilient member which is annularly shaped in plan view and which is provided with an axial opening therethrough, with the peripheral surface of the axial opening forming an inner force-transmitting surface which is provided with annular, peripheral grooves that form a wavelike configuration in vertical cross section;

b. an upper force-receiving shaft disposed in said axial opening and having an exterior peripheral surface which is provided with annular, peripheral grooves that form a wavelike configuration in vertical cross section and which mates with and receives the wavelike inner force-transmitting surface of said resilient member and which is bonded thereto;

c. said resilient member being provided with a peripheral outer force-transmitting surface concentric with said inner force-transmitting surface and which is provided with annular, peripheral grooves that form a wavelike configuration in vertical cross section, and wherein the upper-most portion of the inner force-transmitting surface is axially displaced relative to the outer force-transmitting surface;

d. a lower force receiving outer tube having an interior surface provided with annular, peripheral grooves that form a wavelike configuration in vertical cross section which mates with and receives the wavelike outer force-transmitting surface of said resilient member and which is bonded thereto;

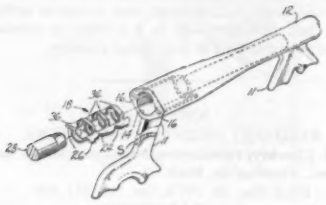
e. said resilient member is provided with an upper surface which is conically shaped, radially outward from the upper end of the inner force-transmitting surface; and,

f. said resilient member is provided with a lower surface which is shaped concave upwardly, radially outward from said inner force-transmitting surface.

3,975,008
FRICTION-GRIP CLIP RELEASABLY ENCOMPASSES ROD

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Division of Ser. No. 451,776, March 18, 1974, Pat. No. 3,910,627. This application Aug. 14, 1975, Ser. No. 604,653
Int. Cl.² F16F 1/00
U.S. Cl. 267—181 4 Claims

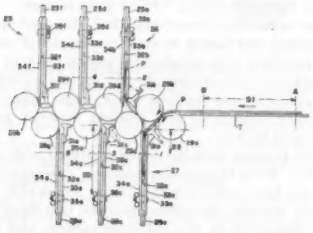


1. A sheet metal clip for frictionally retaining a cylindrical member comprising resilient relatively thin sheet metal members having a plurality of parallel slots formed therein from which a plurality of endless enclosed substantially semi-elliptoidal bearing bands are formed, said bands being axially spaced uniformly and alternately projecting from opposite sides of said member, the inner opposed minor radii of said bands in their relaxed condition, being of a predetermined dimension slightly less than that of corresponding portions of the cylindrical member to be retained, to provide tension in said bands when distended on the said member, thereby providing holding friction which is adequate to retain the member in the clip.

3,975,009
MACHINE FOR FOLDING FLEXIBLE SHEETS

Frank H. Brown, R.D. No. 1, Norwich, N.Y. 13815

Filed Dec. 23, 1974, Ser. No. 535,357
Int. Cl.² B65H 45/14
U.S. Cl. 270—68 A 15 Claims



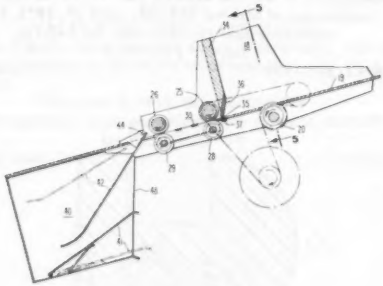
1. A buckle-folding machine for folding sheets of material, comprising a plurality of fold stations each including a pair of pinch rolls and a fold plate defining a sheet-receiving space, infeed means to feed a sheet of material to the fold stations, deflector means at the fold stations operable to one position to cause the sheet to be fed between the pinch rolls and folded and operable to another position to deflect the sheet past the pinch rolls unfolded, dependent upon the dimensions of the sheet, and deflector operating means connected with the deflector means to operate the deflector means to their two positions, said operating means including a plurality of spaced apart first sensing means at the infeed means operatively connected to initiate operation of the deflector means at the first of said plurality of fold stations to effect folding of the sheet at said first fold station when said sheet exceeds a predetermined size as sensed by said first sensing means, and fold station sensing means at each of said fold stations, control means connecting said fold station sensing means together so that one fold station sensing means is operatively connected to a succeeding fold station sensing means at a next succeeding fold station to initiate operation of the deflector means at the next succeeding fold station into said one position to cause the sheet to be fed between the pinch rolls at said next succeeding fold station to further fold the sheet when the presence of the sheet is simultaneously sensed by the first sensing means at the infeed means and by said one fold station sensing means.

11. In a buckle-folding machine for folding sheets of material, the machine including infeed means to feed a sheet of material to the machine, a plurality of fold stations each having a pair of pinch rolls between which the sheets may be fed to be folded, deflector means at each fold station selectively operable to one position to deflect the sheet through the machine unfolded and to a second position to deflect the sheet between the pinch rolls to fold the sheet, and operating means connected between a source of power and the deflector means to operate said deflector means to the first and second positions, the improvement comprising a friction clutch means having a pair of engagable discs in the operating means operative to transmit power from a source of power to the deflector means in normal operation, but operative to slip and interrupt the transmittal of power in the event movement of the deflector means is hindered, to thus protect the operating means and deflector means and wherein the operating means includes first connecting means connecting said clutch means to the power source in a manner which causes said clutch to reciprocate, and second connecting means connecting said deflector means to said clutch means in a manner which causes the deflector to oscillate.

3,975,010
CARD READER WITH IMPROVED PICKING AND TRANSPORT ARRANGEMENT

John C. Schisselbauer, Southampton; John J. Dobson, Oreland, and James E. Gerhart, Cheltenham, all of Pa., assignors to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Mar. 21, 1975, Ser. No. 560,784
Int. Cl.² B65H 3/06, 3/46
U.S. Cl. 271—4 18 Claims



1. Card reader apparatus comprising:
a. a storage bin for holding a plurality of data cards;
b. a collecting bin for collecting cards transported from said storage bin; and
c. transport and picking means for transporting cards separately from said storage bin to said collecting bin, and comprising a throat having two edges defining a passageway for passage therethrough of said transported cards, said passageway being characterized by having a portion

with a plurality of opposing complimentary teeth and an extended toothless regular middle portion, the distance between said edges in said passageway at said middle portion being about the same as at the portion with complimentary teeth.

3,975,011

STACK CHANGER IN CONTINUOUSLY OPERATED SHEET FEEDING MACHINES

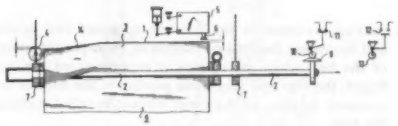
Josef Marass, Seehausen, Germany, assignor to Georg Spiess GmbH, Gersthofen, Germany

Filed June 11, 1975, Ser. No. 586,058

Claims priority, application Germany, Feb. 10, 1975, 2505530

Int. Cl.² B65H 1/26

U.S. Cl. 271—157 1 Claim



1. In a device for changing stacks in continuously operated sheet feeding machines wherein a main stack is raised to the bottom of a residual stack being fed, said residual stack supported by an auxiliary table arranged to be withdrawn on one side of the stack and wherein a progressive drop is formed on the upper side of the residual stack in the course of withdrawal of the auxiliary table, said devices having suction heads disposed over the stacks, the improvement comprising first means actuated as a function of the position of the auxiliary stack table substantially at the start of withdrawal for causing a supplemental advancement of the both stacks (9) and a corresponding raising of the suction head (5), a second means actuated after the completed withdrawal of the auxiliary stack table (2) for causing the suction head (5) to drop down to its original elevation whereby the progressive drop is compensated.

3,975,012

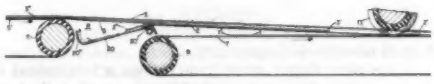
OVERLAPPED SHEET-FEEDING MACHINE

Merton Louis Matthews, Westerly, R.I., assignor to Maxson Automatic Machinery Company, Westerly, R.I.

Filed Nov. 4, 1974, Ser. No. 520,368

Int. Cl.² B65H 29/66

U.S. Cl. 271—183 2 Claims



1. A machine for feeding sheets comprising means for feeding the sheets singly at relatively high speed along a line of feed from one position to a second position, means for receiving the head of each successive sheet at the second position and thereafter feeding the same at relatively low speed to overlap the successive sheets, means disposed intermediate said positions below said line of feed for ejecting air from a location close to said line of feed in a direction substantially opposite to the direction of said line of feed and away from said line of feed to create a pressure drop that deflects the tail of each sheet passing over said air to attract the same out of the line of feed of the head of the next successive sheet as the receiving means feeds the head of the deflected sheet beyond said second position, said ejecting means comprising an air guide frame downwardly sloping from said location and away from the line of feed and substantially in said opposite direction.

3,975,013

SHEET FEEDING DEVICE

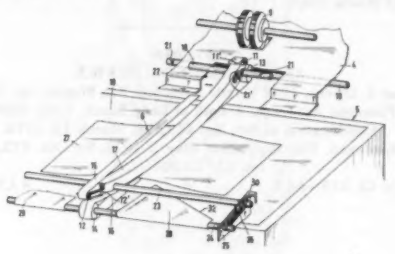
Horst Deisting, Berlin, Germany, assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 16, 1975, Ser. No. 568,590

Claims priority, application Germany, Apr. 25, 1974, 2420165

Int. Cl.² B65H 5/02

U.S. Cl. 271—275 7 Claims



1. A sheet feeding device for the longitudinal conveying of sheets from a document feeder to a printing station, the combination comprising: a first pair of longitudinally spaced guide rollers, means for rotatably supporting one of said first rollers, means secured to the document feeder for supporting and rotatably driving the other of said first rollers, a first conveying belt disposed about said first pair of rollers, a second pair of longitudinally spaced guide rollers, a laterally extending guide shaft supported by the document feeder, a longitudinally extending belt guiding member pivotably mounted on said guide shaft, said means for rotatably supporting said one of said first rollers being supported by said belt guiding member, means associated with said belt guiding member for rotatably supporting said second rollers at opposite ends of said belt guiding member, a second conveying belt disposed about said second pair of rollers, said second belt extending parallel to said first belt and being in operational engagement therewith, and means for laterally positioning said conveying belts and said belt guide member.

3,975,014

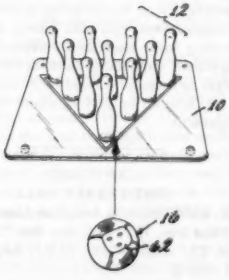
LAWN BOWLING APPARATUS

John W. Ryan, 674 Nimes Road, Los Angeles, Calif. 90024, and James D. Moore, 6810 Locklenna Lane, Palos Verdes, Calif. 90274

Filed Feb. 5, 1975, Se.. No. 547,181

Int. Cl.² A63D 1/02, 5/08

U.S. Cl. 273—45 4 Claims



1. Game apparatus comprising a platform and means to support it at a predetermined level, a group of playing pins to be set on the platform and means providing connections between the pins and platform allowing them to be knocked down and set up, the connections to the pins including cords secured to the bottom of each pin passing through openings in

the platform, and manual means attached to the cords whereby upon manipulation of the manual means all pins can be simultaneously set up, the manual means comprising a lever having a pivotal attachment to the platform, each of said pins being hollow having a bottom opening, each of said cords having an end part configurated to pass through the bottom opening in the pin and then to anchor on the inside of the pin, said lever and cords being of integral molded construction, the lever being rigid and the cords being in the form of molded thin plastic strips.

3,975,015

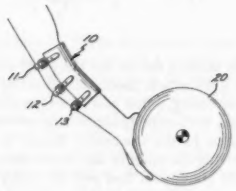
ARM RESTRAINING DEVICE

Paul J. Owens, 1979 Myrtle Ave., and Ben Maples, Jr., 2432 Pasadena Ave., Apt. 4, both of Long Beach, Calif. 90806

Continuation of Ser. No. 453,598, March 22, 1974, abandoned. This application May 1, 1975, Ser. No. 573,608

Int. Cl.[2] A63B 71/14

U.S. Cl. 273—54 B **4 Claims**



1. An arm restraining device for use in bowling activities, comprising:

a. a rigid shell support structure being continuous in contour conformed into a substantially longitudinally extending segment of a cylinder having linearly extending first and second sections, said first and second linearly extending sections intersecting each other at a predetermined angle proximate the longitudinal center of said cylinder and adapted to be secured substantially contiguous the biceps and inner forearm for distributing force loads over a substantial arm area:

b. an exteriorly overlying, partly expandable membrane disposed over the exterior of said continuously contoured support structure;

c. an interiorly overlying, partly extendable membrane disposed over the interior of said support structure secured to said exteriorly overlying membrane distal of the longitudinal edges of said support structure;

d. a layer of open cell foam attached to said interiorly overlying member, said layer being positionally located in mating engagement with said biceps and inner forearm for absorbing force loads and perspiration; and,

e. securing means attached proximate the opposing longitudinal edges and center of said membrane for securing an arm on the interior of said structure in a predetermined joint alignment.

3,975,016

INFLATABLE BALL

Steven Bodor, 6538 Fountain Ave., Los Angeles, Calif. 90028

Filed Dec. 16, 1974, Ser. No. 518,996

Int. Cl.[2] A63B 41/00, 41/12; A63H 1/32

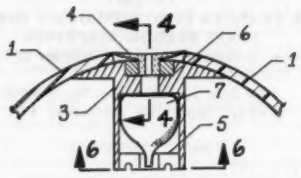
U.S. Cl. 273—58 R **10 Claims**

1. The combination of an inflatable ball and integral pivot bearing comprising:

an inflatable ball;

a bearing housing affixed adjacent an aperture in the ball interiorly of the ball and having a corresponding opening aligned with said aperture;

a rotator positioned in substantial alignment with the opening and having an exposed portion accessible to a user therethrough; and



a bearing mounted in the housing adjacent said aperture and mounting the rotator therein so as to permit spinning of the ball while the rotator is supported on the user's finger, the exposed accessible portion of the rotator being recessed relative to the outer circumferential surface of the ball.

3,975,017

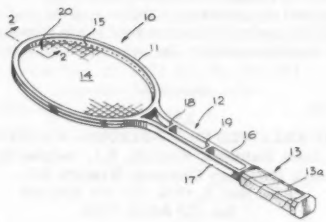
TENNIS RACKET

Thomas Patrick Galich, Dana Point, Calif., assignor to Professional Amateur Industries, Inc., Costa Mesa, Calif.

Filed May 10, 1974, Ser. No. 468,924

Int. Cl.[2] A63B 49/12

U.S. Cl. 273—73 H **13 Claims**



1. A tennis racket comprising:

a one-piece forged metal frame having a longitudinal dimension of approximately 27 inches and a thickness dimension of 0.580 inches plus 0.020 inches, minus 0.000 inches, the frame having a standard oval head portion and a handle portion interconnected by a shaft portion, said head portion comprising opposed ends and opposed sides and having a first thickness dimension in the range of 0.580–0.600 inches and a first width dimension tapering from 0.280 ± 0.020 inches at the end remote from the shaft portion to 0.200 ± 0.020 inches at the end adjacent the shaft portion, the sides being 0.230 ± 0.020 inches in width;

said shaft portion including a first arm having second width and second thickness dimensions and a second arm having third width and third thickness dimensions;

said second and third width dimensions being equal; and

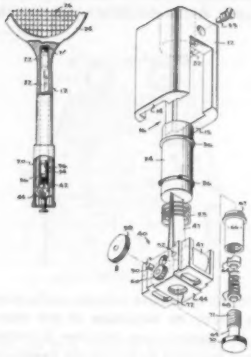
said second and third thickness dimensions being equal, the material of the frame including aluminum.

3,975,018

RACKET CONSTRUCTION

Frank J. Walker, 8340 NE. Second Ave., Miami, Fla. 33138

Filed Aug. 8, 1975, Ser. No. 603,088
Int. Cl.² A63B 49/04
U.S. Cl. 273—73 R 15 Claims



1. An elongated hand-held device for striking another object comprising a handle portion on one end of the device dimensioned to be held in the hand of a user, an object-engaging portion connected to the handle portion for striking an object during use of the device, weight means normally maintained in a first position in said handle portion and release means for permitting movement of said weight means to a second position in the vicinity of said object-engaging portion in response to the angular velocity of the device exceeding a predetermined value as the device is swung by a user, said release means including constant-force providing means for exerting an unchanging constant force on said weight means for all positions of said weight means for urging said weight means toward said handle.

3,975,019

PINBALL TYPE GAME APPARATUS

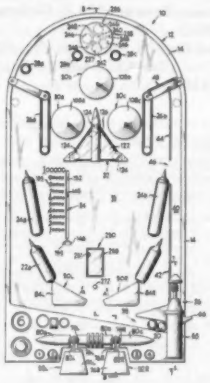
Gordon A. Barlow, Skokie, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 27, 1974, Ser. No. 446,142
Int. Cl.² A63D 3/02, 13/00, 15/20
U.S. Cl. 273—121 A 5 Claims

2. In a pinball apparatus including a housing having an inclined generally planar playing surface over which a ball may be propelled, at least one ball to be propelled on said playing surface, and a flipper assembly for striking a ball in play in order to keep said ball in play, said flipper assembly having a ball hitting portion rotatably mounted about a generally vertical axis on said surface for striking said ball and actuating means for rotating said ball hitting portion, the improvement in said actuating means comprising:

a manually operable means mounted for reciprocal movement in a direction generally perpendicular to the plane of said playing surface; and

linkage means operably connecting said manually operable means with said ball hitting portion for transmitting said reciprocal movement of said manually operable means generally perpendicular to the plane of the playing surface into reciprocal movement of said ball hitting portion generally parallel to said plane of said playing surface.

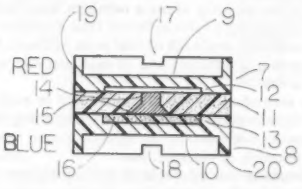


3,975,020

BOARD GAME APPARATUS

Charles B. Vogel, 210 Walnut Bend, Houston, Tex. 77042

Filed May 28, 1975, Ser. No. 581,630
Int. Cl.² A63F 3/02
U.S. Cl. 273—131 AB 11 Claims



1. Game apparatus comprising pairs of visually identical playing pieces wherein each of said pieces of each pair is a member formed to stand with stability upon a horizontal surface while supported thereon by either of two oppositely directed faces of said member, the improvement comprising:

exterior form and color imparted to said member such that said faces are visually identifiable as a first particular face and a second particular face;

on a first particular member only of each pair of said pieces first indicating means effective to produce a particular distinctive sound in response to application of impulsive finger pressure to said first face of said first particular member while the pair rests upon said surface;

on a second particular member only of said pair second indicating means effective to produce said sound in response to application of said pressure to said second face of said second particular member while the pair rests upon said surface;

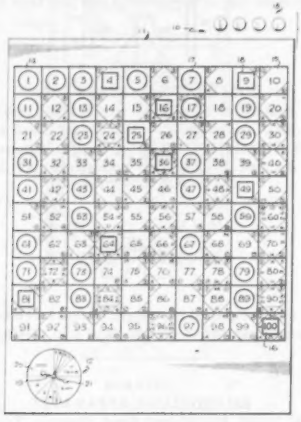
whereby said pieces may be oriented to constitute a first group in which each of the pieces exhibits said first face upward and a second group in which each of the pieces exhibits said second face upward;

and whereby in the absence of said pressure said groups provide no conclusive visual information as to locations of those of said pieces which are oriented to produce said sound.

3,975,021
EDUCATIONAL DEVICE EMPLOYING A GAME SITUATION

Melbourne Thomas Brown, 1825 E. Gaviota Court, Simi Valley, Calif. 93065

Filed Dec. 30, 1974, Ser. No. 537,363
Int. Cl.² A63F 3/06
U.S. Cl. 273—135 B 8 Claims



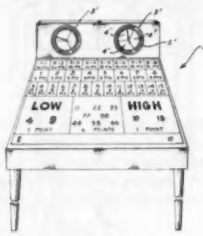
1. A game apparatus for teaching the relationship of numbers comprising:
   a. A playing board including:
      i. a plurality of contiguous areas;
      ii. a like plurality of main numbers, each said main number having a value different than any other of said main numbers, and each of said main numbers being located within a different one of said plurality of contiguous areas; and
      iii. secondary indicia means located in each of said contiguous areas for respectively identifying factors of said main numbers;
   b. a plurality of markers; and
   c. chance means operable in turn by players of said game apparatus for determining placement of markers upon selected ones of said contiguous areas, said chance means having a plurality of differing indicia means thereon, certain ones of said differing indicia means corresponding identically to certain ones of said main numbers and to certain ones of said secondary indicia means, each of said differing indicia means having a mathematical relationship with more than one of said areas, said relationships defining the contiguous areas wherein said respective players may place a marker per turn.

3,975,022
PARLOR GAME DEVICE

Luisito A. Figueroa, 39 Banaba Road, Forbes Park, Makati, Rizal, Philippines (3116)

Filed Feb. 26, 1975, Ser. No. 553,090
Int. Cl.² A63F 5/04
U.S. Cl. 273—141 A 2 Claims

1. An electrically operated game device comprising a number selector means including at least two spinnable pointers each mounted centrally of an opening; a circular band defined on the wall of each opening and concentric therewith, said circular bands each being divided into a predetermined number of sector groups with each sector group being comprised of numbered radial segments; a plurality of studs each secured in-between said radial segments and cooperable with means on said pointers for indexing said pointers; timing circuit means operably connected to said pointers to control the sequential and variable rotation thereof to randomly indicate a number in any of said sector groups; said timing circuit means including a motor driven gang of switch-actuating cams, said gang including a first cam having a plurality of equally, symetrically positioned actuating notches for opening two circumferentially spaced switches each cammed by the first cam when the respective switches are indexed by a respective notch, said gang further including an additional cam for each respective pointer, each said additional cam having the same plurality of notches as the first cam but having the actuating notches unsymetrically positioned thereon, a switch controlled by each additional cam which switch actuates a

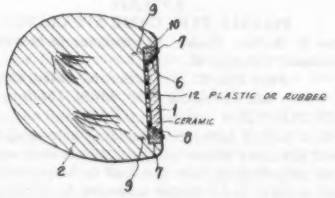


motor for turning its respective pointer, and a player operable start button, whereby on actuation of the start button the motor driving the ganged cam switches is initially actuated and is maintained actuated by one of the switches cammed by the first cam, while the additional cams actuate their associated switches to rotate the pointer motors until such associated switches are opened at the cam notches, whereby the said one switch of the first cam is opened at the next notch with the cam motor still maintaining driving rotation under the control of the now closed second switch associated with the first cam until said second switch is opened at the next notch occuring on the first cam to complete one overall actuation of the device.

3,975,023
GOLF CLUB HEAD WITH CERAMIC FACE PLATE

Kazuo Inamori, Kyoto, Japan, assignor to Kyoto Ceramic Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 314,678, Dec. 13, 1972, abandoned.
This application Feb. 26, 1974, Ser. No. 445,984
Claims priority, application Japan, Dec. 13, 1971, 46-117327[U]
Int. Cl.² A63B 53/04
U.S. Cl. 273—173 10 Claims



1. A golf club head comprising:
   a. a striking face adapted to strike a golf ball, said striking face defining a recessed mating groove;
   b. a face plate having a thickness of from about 10 to 20 mm and consisting essentially of a ceramic comprising alumina as the major component, said face plate further characterized as having an irregular exterior surface formed of fine aggregate of said ceramic, said face plate fitted into said mating groove such that said exterior

surface of said face plate is flush with said striking face; and

c. an elastic sheet member disposed in said mating groove so as to be sandwiched between said face plate and said golf club head.

3,975,024

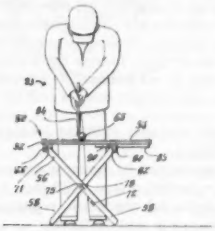
GOLF TRAINER DEVICE

Lawrence J. Stephan, Fairfield, Conn., assignor to Progressive Swing Method, Inc., Fairfield, Conn.

Continuation-in-part of Ser. No. 479,200, June 14, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 556,152

Int. Cl.² A63B 69/36

U.S. Cl. 273—193 R 3 Claims



1. Apparatus for golf training comprising: three golf clubs each having a different length, one of said lengths being 15 inches and the other two lengths being in a range between 15 inches and 35 inches with said three lengths being significantly different from each other; a platform for supporting a golf ball thereon; and means for supporting said platform above a ground surface, said means being adjustable to support said platform at three significantly different heights above said ground surface, each of said heights permitting a golfer to hit a golf ball from said platform with each of said golf clubs.

3,975,025

PICKUP CARTRIDGE

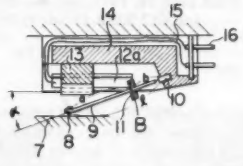
Shuichi Obata, Kyoto; Akira Kagata, Neyagawa; Katsuhiko Morita, Kyoto; Masatoyo Kubo, Hirakata, and Masashi Itoh, Ibaragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 20, 1973, Ser. No. 381,085

Claims priority, application Japan, July 21, 1972, 47-73746

Int. Cl.² H04R 1/16, 11/08; G11B 3/02

U.S. Cl. 274—37 29 Claims



1. A pickup cartridge for reproducing signals recorded on a 45° — 45° type stereophonic sound recording disk having two or more independent signals recorded in a single sound groove thereof, said pickup cartridge comprising

a stylus assembly including a stylus arm having a longitudinal axis, a stylus tip attached to one end of said stylus arm, a stylus arm supporter made of viscous resilient material for pivotally supporting the other end of said stylus arm, a stylus-to-transducer coupler of viscous resilient material having a side surface and an edge secured to the mid-portion of said stylus arm on the longitudinal axis thereof, and a casing for holding said stylus arm supporter in place,

a pair of pressure-to-electricity transducers each having a longitudinal axis, a major surface and an edge, the projections of said major surfaces intersecting at substantially a right angle and forming angles of substantially 45° with a surface of said sound recording disk, the intersection of the major surfaces of said transducers further defining a line in a plane through the longitudinal axis of said stylus arm, and

a damper made of viscous resilient material secured to said casing and to said transducers, both of said transducers slidably engaging said stylus-to-transducer coupler to provide continuous slidable coupling of said transducers with said coupler, a mechanical vibration picked up by said stylus tip from the sound groove of said disk being converted by said transducers to an electrical signal.

3,975,026

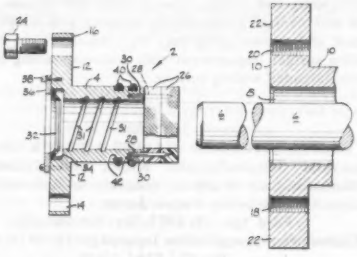
SEALING CARTRIDGE FOR ROTATING SHAFTS

Robert John Boyle; Howard Lewis Rucker, both of Littleton; Alex Anthony Mastro, Aurora, and Thomas Peter Jackson, Littleton, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 14, 1975, Ser. No. 550,095

Int. Cl.² F16J 15/00

U.S. Cl. 277—4 8 Claims



1. A sealing cartridge for sealing a rotating shaft at the point where said shaft passes through an opening in a casing wall, which comprises:

a. a hollow cylindrical housing, having an axially inward end, an axially outward end, and an exterior surface, within which housing said shaft can rotate freely;

b. attaching means for attaching said housing to said casing wall;

c. a radial pressure lip seal disposed adjacent to the axially outward end of said housing and removably retained therein and containing means to continuously urge the lip of said seal against said shaft;

d. at least one compressed mechanical packing element disposed adjacent to and axially inwardly of said housing and aligned therewith, said element maintaining a mechanical sealing relation with said shaft; and

e. aligning means cooperating with said housing to maintain said compressed mechanical packing element aligned with said housing.

3,975,027

FACE SEAL

James J. D'Amico, Painesville, Ohio, assignor to Flex, Incorporated, Mentor, Ohio

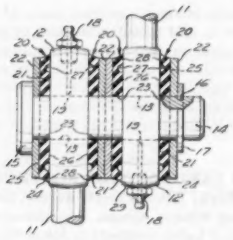
Filed July 18, 1975, Ser. No. 597,072

Int. Cl.² F16J 15/34

U.S. Cl. 277—84 10 Claims

1. A face seal for retaining lubricant in a mechanical connection comprising a pin and an eye having an annular sealing surface intended for engagement by said seal surrounding a pin-receiving opening, said seal comprising a thin annular

body having a central axis and pin-receiving opening and a resiliently flexible annular axially extending lip having a radially inner conical sealing surface inclined to an intended annular sealing surface at a first angle and a radially outer non-sealing surface inclined to the same intended annular sealing surface at a second angle greater than said first, the average inclination of said first and second angles to their intended annular sealing surface being inclined from the vertical to



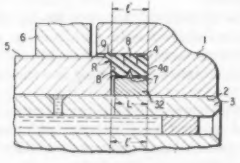
their intended annular sealing surface so said lip has a decided bent with respect to their intended annular sealing surface insuring sealing engagement with the intended annular sealing surface of said conical sealing surface only of said lip, said lip surrounding and radially spaced from and coaxial with said axis and central pin-receiving opening and adapted to be flexed and pressed with only its conical sealing surface in sealing surface engagement with a corresponding and juxtaposed intended sealing surface.

3,975,028

APPARATUS FOR SEALING A TRACK SHOE

Kazuyoshi Satsumabayashi, Kyoto, and Takeshi Kato, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 15, 1975, Ser. No. 568,290
Claims priority, application Japan, Apr. 16, 1974, 49-41809
Int. Cl.² F16J *15/38*
U.S. Cl. 277—94 **10 Claims**



1. Apparatus for sealing a track shoe system of an endless track of a tractor-type vehicle, comprising:

a pin;

a link disposed about said pin;

means defining a counterbored recessed portion within said link;

a bushing disposed about said pin adjacent said link wherein the end of said bushing disposed toward said link is partially disposed within said recessed portion of said link so as to define therewith an annular space; and

seal means disposed within said counterbored portion of said link and interposed between said end of said bushing and said link, said seal means being compressible in the axial direction within said counterbored portion and including an axially extending projection projected from the outer peripheral portion of said seal means disposed within said annular space,

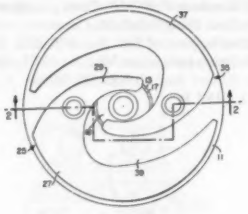
whereby sealing of said system is positively attained.

3,975,029

DRILL BIT CENTRIFUGAL VISE

George Washington Benjamin, 1220 Enslow Blvd., Huntington, W. Va. 25701

Filed Aug. 13, 1974, Ser. No. 497,037
Int. Cl.² B23B *31/14*
U.S. Cl. 279—1 C **10 Claims**



1. A centrifugally actuated drillhead locking device comprising, in combination,

base plate means adapted to mount upon and move rotatably with a rotatably driven drillhead, and having an opening in substantial concentric registration with tool shaft socket means in said drillhead;

pivot means mounted on said base plate means on an axis parallel to and eccentric from a longitudinally extending axis through the opening in the base plate means and the tool shaft socket means in said drillhead;

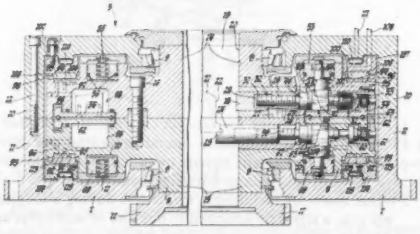
vise lock element means pivotally mounted on said pivot means, having a major arm element extending from its pivotal mounting point in one direction and a minor arm element extending from its pivotal mounting point in another direction, pivotally moveable between a first position in which the minor arm element is in engagement with said tool shaft, said vise lock element means being so arranged and disposed relative to the device that it is urged from said first position towards and into said second position as said major arm element is moved outwardly by centrifugal force developed upon rotational movement of said rotatably driven drillhead.

3,975,030

CHUCK WITH DUAL INDEPENDENTLY ACTUABLE SETS OF JAWS

A. Hadi K. Akeel, Sterling Heights; Romuald Gmurowski, Mount Clemens, and Eberhard E. Wasserbaech, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 18, 1975, Ser. No. 587,818
Int. Cl.² B23B *31/14, 31/18*
U.S. Cl. 279—4 **3 Claims**



1. A chuck to hold a workpiece in a machine for spinning the workpiece about an axis and machining surfaces thereof, the chuck comprising:

an annular body rotatably disposed in the machine and adapted to be rotatably driven thereby;

a first set of at least three jaws movable radially inward from the annular body to grip the workpiece;

a second set of at least three jaws movable radially inward from the annular body to grip the workpiece, the second set of jaws being axially displaced from the first set whereby the first set of jaws grips the workpiece at a first outer surface and the second set of jaws grips the workpiece at a second outer surface axially displaced from the first outer surface;

means for moving the first set of jaws inward independently of the second set to grip the workpiece;

first locking means actuable, upon engagement of all jaws of the first set with the workpiece, to lock the first set of jaws in such engagement, whereby the workpiece can be turned about the workpiece axis and machined on surfaces including the second outer surface;

means for moving the second set of jaws inward independently of the first set into engagement with the machined second outer surface of the workpiece, locking the second set of jaws in such engagement to grip the workpiece, deactivating the first locking means and moving the first set of jaws radially outward from the workpiece, said means including, for each jaw of the second set, a slip clutch effective to limit the force applied by the associated jaw to the workpiece, whereby all jaws of the second set can be moved into engagement with the workpiece and the workpiece can be further turned and machined on surfaces including the first outer surface without stopping workpiece rotation or shifting the workpiece axis.

3,975,031

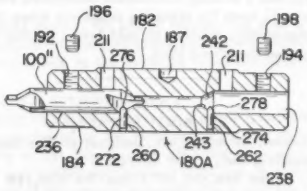
TOOL MOUNTING DEVICE

Gene Lee Bennett, North Madison, Ohio, assignor to Genio Tools, Inc., North Madison, Ohio

Continuation-in-part of Ser. No. 351,163, April 16, 1973, Pat. No. 3,841,646, Continuation-in-part of Ser. No. 183,090, Sept. 23, 1971, Pat. No. 3,754,767. This application Sept. 23, 1974, Ser. No. 508,210

Int. Cl.² B23B *31/04*

U.S. Cl. 279—14 **17 Claims**



1. In a tool holder for a center drill having a circular shank portion of a given diameter, a smaller diameter tip portion coaxial with said shank portion, a tapered portion between said shank and tip portions, and flute means extending from said tip portion through said tapered portion and into said shank portion, said flute means including recess means having terminal end means interconnecting the circular outer surface of said shank portion, and said tool holder comprising a body member having an end and a tool receiving passage extending thereinto from said end, the improvement comprising: said passage having an axially outer cylindrical portion of a diameter to receive said shank portion and an axially inner portion to receive said tip portion, said inner portion of said passage having a transverse dimension smaller than said given diameter of said shank portion of said center drill, said passage including a tapered section between said outer and inner portion of said passage, said tapered section being engaged by said tapered portion of said center drill to axially position said center drill in said passage, and abutment means in said passage to engage said flute means against rotation of said center drill in said passage, said abutment means including surface means located radially inwardly with respect to the surface of said axially outer cylindrical portion of said passage, and said abutment means being axially located in said passage to intersect both said outer cylindrical portion and said tapered section of said passage.

3,975,032

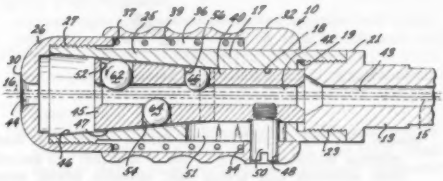
SURGICAL WIRE DRIVING ASSEMBLY

John H. Bent, Fullerton, and Anthony Russo, La Habra, both of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 460,813, April 15, 1974, abandoned. This application Mar. 12, 1975, Ser. No. 557,599

Int. Cl.² B23B *5/34*

U.S. Cl. 279—30 **19 Claims**



1. A surgical wire driving assembly for driving a wire in a rotary direction and providing for operator controlled incremental axial movement of said wire comprising:

body means having a bore, the forward end of which is tapered,

retainer means having a complementary taper positioned in said bore and having a passageway therethrough to receive a wire element to be driven,

one of said body and retainer means being movable axially relative to the other,

means to effect rotation of said body and said retainer means,

said retainer means including at least three sets of spaced spherical wire engaging elements positioned along and circumferentially about the axis of the passageway and movable radially thereof and being operative in a first position of said retainer means relative to said body means to establish a wobble-free driving relation with respect to a wire located in said passageway and operative in a second position of said retainer means relative to said body means to establish a release position with respect to a wire located in said passageway,

means to bias one of said body and retainer means into one of said first or second positions, and

manually movable means having a surface engageable by an operator's hand to effect movement of one of said body and retainer means to the other of said first or second positions.

3,975,033

SAFETY SKI BINDING

Viktor Lill, Schwechat; Ernst Rossler, Vienna; Josef Svoboda, Schwechat, and Erwin Weigl, Brunn am Gebirge, all of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed June 5, 1975, Ser. No. 584,106

Claims priority, application Austria, June 14, 1974, 4946/74; Oct. 9, 1974, 8103/74

Int. Cl.² A63C *9/086*

U.S. Cl. 280—618 **14 Claims**

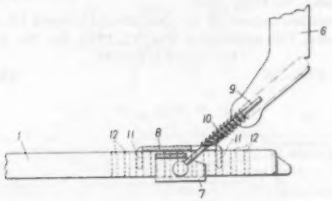
1. A safety ski binding, comprising:

a sole plate and releasable securement means for securing said sole plate to a ski;

spaced first locking means on said sole plate;

toe engaging means mounted on said sole plate for engaging and holding a toe of a ski boot to said ski;

movable heel engaging means movably mounted in a longitudinal direction on said sole plate for movement toward and away from said toe engaging means and for engaging and holding a heel of said ski boot to said sole plate, said heel engaging means including first and second vertically spaced slide members slidingly engaging vertically spaced surfaces on said sole plate and on opposite lateral sides thereof, one of said first and second slide members having second locking means thereon engaging said spaced first locking means on said sole plate to fixedly locate said movable heel holding means in a desired location on said sole plate; and



spaced first and second resilient means engaging at least opposite lateral sides of said one of said first and second slide members and urging said opposite lateral sides thereof toward the other of said first and second slide members to clamp said sole plate therebetween and urging said first and second locking means into engagement with each other whereby a relative movement away from each other of said first and second slide members against the urging of said first and second resilient means to effect on equal spacing between the lateral sides of said first and second slide members will effect a release of the engagement between said first and second locking means to facilitate said longitudinal movement of said heel engaging means relative to said sole plate.

3,975,034

SAFETY SKI BINDING

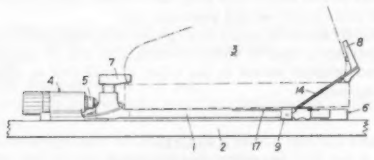
Erwin Weigl, Brunn am Gebirge; Ernst Rossler, Vienna, and Josef Svoboda, Schwechat, all of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed July 7, 1975, Ser. No. 593,840

Claims priority, application Austria, July 12, 1974, 5806/74

Int. Cl.² A63C *9/086*

U.S. Cl. 280—618 **5 Claims**



1. A safety ski binding, comprising:

a sole plate and releasable securement means for securing said sole plate to a ski;

spaced first locking means on said sole plate;

toe engaging means mounted on said sole plate for engaging and holding a toe of a ski boot to said ski;

movable heel engaging means movably mounted in a longitudinal direction on said sole plate for movement toward and away from said toe engaging means and for engaging and holding a heel of said ski boot to said sole plate, said heel engaging means including a carriage having vertically and fixedly spaced first and second slide members slidingly engaging vertically spaced surfaces on said sole plate and on opposite lateral sides thereof, one of said first and second slide members having second locking means thereon engaging said spaced first locking means on said sole plate to fixedly locate said movable heel holding means in a desired location on said sole plate; and

means defining a longitudinal extending gap between an edge of said first slide member remote from said toe engaging means and an edge of said second slide member opposing said toe engaging means to facilitate a simultaneous rocking of said first and second slide members about a horizontal axis traverse of said sole plate to move said second locking means out of engagement with said first locking means and a longitudinal movement of said heel engaging means relative to said sole plate.

3,975,035

SKI BINDINGS

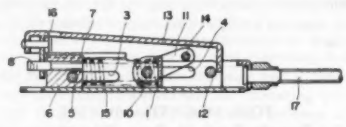
Masahiro Murata, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

Filed July 28, 1975, Ser. No. 599,464

Claims priority, application Japan, July 31, 1974, 49-91912[U]

Int. Cl.² A63C *9/083*

U.S. Cl. 280—621 **4 Claims**



1. A ski binding including a front metal fitting which comprises a base plate secured to a ski, a block and a spring seat each mounted on said base plate to be slidable in the longitudinal direction of said ski, a compression spring interposed between said block and said spring seat, a lever pivotally mounted on said base plate, a link interconnecting said spring seat and said lever so as to bias said lever to rotate, means for applying a rearward compressive force to said block from a heel piece, and a locking mechanism interposed between said block and said lever for releasing said lever when the block is moved rearwardly, relative to said lever, by the heel piece beyond a predetermined limit.

3,975,036

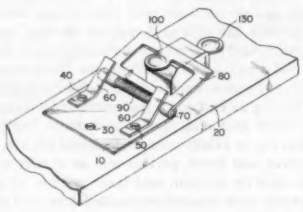
SKI BOOT SCRAPER

John P. Glenn, Arvada, Colo., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Nov. 25, 1975, Ser. No. 635,118

Int. Cl.² A63C *11/00*

U.S. Cl. 280—11.37 E **2 Claims**



1. A ski boot scraper for use on skis, comprising:

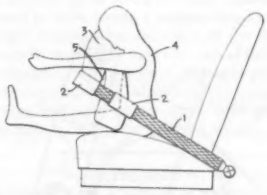
a flat, rectangular piece;
a hinge extending transversely across the ski attached to the bottom edge of the piece to allow it to pivot about its bottom edge;
a spring biasing the piece towards a generally vertical position;
braces attached to the ski for abutting and thereby supporting the piece in a generally vertical position against the pressure of the spring; and
a catch means attached to the ski and cooperating with the piece to hold the piece in a generally horizontal position when the catch means is locked and allowing the piece to abut the braces when the catch means is unlocked.

3,975,037

AUTOMOTIVE SAFETY DEVICE

Heinrich Hontschik, Mullerstr. 25, Frankfurt am Main; Ingobert Schmid, Im Kleinen Grund 15, 6241 Rossert, and Peter Greiner, Bonameser Str. 51, 6 Frankfurt am Main 50, all of Germany

Filed Dec. 10, 1973, Ser. No. 423,148
Claims priority, application Germany, Dec. 9, 1972, 22603663
Int. Cl.² B60R *21/10*
U.S. Cl. 280—733 **5 Claims**



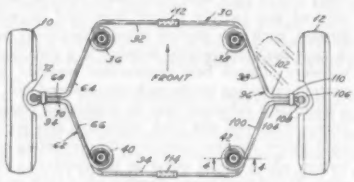
1. A safety device, for use in connection with a vehicular seat, especially for the protection of a young person such as a child or a youth, in the event of rapid deceleration of the vehicle,
comprising in combination,
a retaining safety belt having a looped front portion and being anchored in the vehicle to the rear of the person relative to the direction of vehicular movement,
at least one deformable air bag disposed, in normal sitting position of the person, substantially at average hip height in front of the person, and
belt loops arranged on said belt comprising a first belt loop connected to a portion of said air bag disposed away from the person during normal use and connected to said belt near the forwardmost part thereof; a second belt loop connected to a portion of said air bag disposed near the person during normal use and being slidably connected to said belt at a part normally disposed laterally adjacent said air bag during use; said belt loops cooperating with said belt to hold and to guide the air bag in such a manner that upon rapid deceleration of the vehicle the body of the person will exert further pressure on the air bag and thereby drive the portion of the air bag adjacent the person which is slidably connected to the belt towards the front portion of the belt, whereby the air bag will be deformed and be raised in front of the body of the person, for protecting the person.

3,975,038

TORSION BAR SPRING SUSPENSION

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 7, 1975, Ser. No. 594,143
Int. Cl.² B60G *11/20*
U.S. Cl. 280—700 **8 Claims**



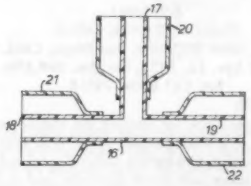
1. An independent suspension system for a motor vehicle having a vehicle frame;
left and right road wheels positioned adjacent said frame;
suspension means interconnecting said wheels and said frame;
said suspension means comprising left and right wheel support members rotatably supporting said left and right road wheels;
left and right, mutually independent, wheel locating suspension members connected to said left and right wheel support members, respectively, and pivotally connected to said frame;
a spring bar having the shape of a closed figure;
said spring bar having fore and aft transverse bar portions extending transversely of said vehicle frame;
said fore and aft bar portions of said spring bar being longitudinally spaced apart;
said spring bar having left and right bar portions connected to said fore and aft transverse portions;
left and right pivot means connecting the outer ends of said left and right bar portions to said left and right wheel support members, respectively;
said left and right bar portions determining, in part, the lateral location of said left and right wheel support members relative to said frame,
means connecting said spring bar to said vehicle frame.

3,975,039

HEAT-RECOVERABLE MEMBERS

Richard J. Penneck, Lechlade, and Alexander M. Wood, Swindon, both of England, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 195,150, Nov. 3, 1971. This application Oct. 23, 1974, Ser. No. 517,230
Claims priority, application United Kingdom, Nov. 3, 1970, 52221/70
Int. Cl.² F16L *41/00*
U.S. Cl. 285—156 **20 Claims**



11. A one-piece coupling device for attachment to a plurality of distortable substrates comprising:

a rigid sleeve member having a plurality of arm portions integrally formed at a junction; and

a hollow, heat recoverable member disposed about each of said arm portions, an end of each heat recoverable member positioned adjacent the junction being in firm engagement with each respective arm portion by heat recovery of said end to tightly grip each respective arm portion, the other end of each heat recoverable member being unrecovered and radially spaced from said respective arm portion, each arm portion being respectively positioned in each heat recoverable member in a direction of heat recovery of each heat recoverable member, each arm portion extending inside each unrecovered end, whereby a distortable substrate may be positioned between each unrecovered end and each respective arm portion, said rigid sleeve member substantially preventing radial distortion which would occur to the substrates in the absence of said rigid sleeve member when each unrecovered end is heat recovered.

3,975,040

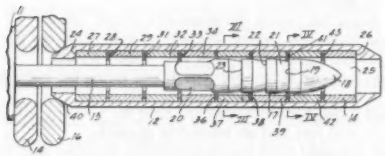
SNAP RING LOCK SEAL

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Oct. 1, 1975, Ser. No. 618,387

Int. Cl.² B65D *33/34*

U.S. Cl. 292—318 **10 Claims**



1. A snap lock seal comprising;

a first locking member formed with a plurality of tapered grooves each separated a first predetermined distance from adjacent grooves and having transversely extending shoulders,

a second locking member engageable with said first locking member,

a plurality of snap rings mounted on said second locking member and prevented from longitudinal movement and receivable in said tapered grooves such that at least one of said snap rings locks against at least one of said shoulders to lock said first and second locking members to prevent longitudinal movement therebetween in a first longitudinal direction, and

said snap rings having a spacing different from said first predetermined distance.

3,975,041

SLIDING PANEL LOCK

Timothy Edison, 2590 Highland, San Diego, Calif. 92105

Filed Apr. 18, 1975, Ser. No. 569,590

Int. Cl.² E05C *19/18*

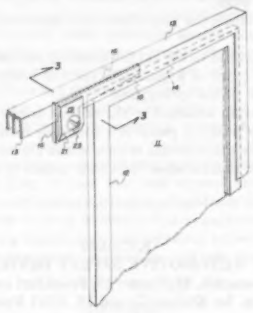
U.S. Cl. 292—258 **3 Claims**

1. A sliding panel lock for limiting the sliding and preventing the removal of a sliding panel of the type that that has a frame, the top portion of which is slidably received by a guide channel having inner and outer sidewalls and a top surface integral therewith comprising:

a wedge member having an inclined lower edge;

a clamp member; and

coupling means coupling said clamp member to said wedge member, said wedge member and said clamp member sandwiching one of said channel sides and being clamped thereto, said inclined edge being dimensioned for cooperating with a top corner of said sliding panel and extending over a portion of the top edge of said sliding panel.



3,975,042

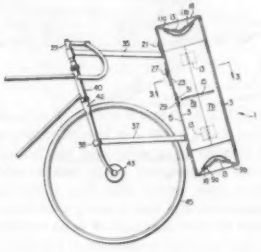
PNEUMATIC CYCLE BUMPER

Anthony Montenare, 326 N. 4th St., Reading, Pa. 19601

Filed Sept. 5, 1974, Ser. No. 503,443

Int. Cl.² B60R *19/10, 21/14;* **F16F** *9/04, 9/34*

U.S. Cl. 293—61 **7 Claims**



1. A pneumatic bumper for a cycle comprising a front and a back connected to one another in normal spaced apart relationship to leave an inner air chamber, said front and back being interconnected by hinged collapsible side means and flexible cover means which encloses said chamber and seals same in a substantially airtight seal, means on said bumper urging said front and back apart and said bumper having exhaust means communicating with said chamber to allow the controlled escape of air when said front and back are urged towards one another upon impact and said side means collapsed, said bumper having coupling means for attachment to the forward end of a cycle in advance of the front wheel.

3,975,043

GRIPPING DEVICE

Leslie John Miles, 37 Garrick St., Gympie, Queensland 4570, Australia

Filed Mar. 4, 1975, Ser. No. 555,122

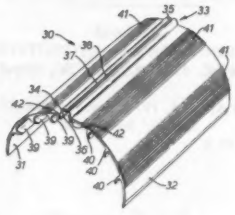
Claims priority, application Australia, Mar. 4, 1974, 6797/74

Int. Cl.² B65G *7/12*

U.S. Cl. 294—25 **3 Claims**

1. A gripping device including a pair of side assemblies each having a substantially constant arcuate cross-sectional configuration throughout its length and projections on its concave inner surface, said side assemblies having free outer edges and

also having inner edges, hinge means hingedly connecting said inner edges together to enable said outer edges to be moved towards or away from one another to form therebetween an adjustable opening into a diverging chamber formed between said side assemblies, one said side assembly having along its inner edge a channel having a restricted opening and the other said side assembly being provided with a bead along its inner edge which is pivotally engageable within said channel by relative longitudinal sliding movement therebetween to form said hinge means; a torsion-bar spring assembly disposed adjacent said hinge means and connected at its opposite ends into a recess in the respective side assembly and adapted to



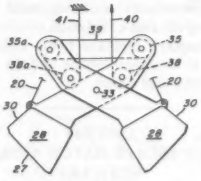
urge the said side assemblies apart, said recesses being disposed adjacent said hinge means and being deformable to claim the respective end of said torsion-bar spring therein to maintain said side assemblies in their operative longitudinal relationship, and the parts being so made and arranged that said device may be held within a cupped hand of a user with said outer edges remote from the palm of the hand and disposed substantially parallel to the pivot axis of the user's hand, whereby an elongate object aligned with said pivot axis may be passed between said outer edges into the cupped hand for gripping thereby and said object when thus gripped being shielded from said hand by said gripping device.

3,975,044

REEVING SYSTEM FOR A SCISSOR-TYPE CLAMSHELL BUCKET

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 386,314, Aug. 7, 1973, abandoned.
This application Feb. 28, 1975, Ser. No. 553,895
Int. Cl.² B66C *3/06*
U.S. Cl. 294—70 **1 Claim**



1. In a bucket assembly for use in a material handling apparatus comprising a support structure and a scissors-type clamshell bucket arranged below said support structure, said bucket having a first and second pair of parallel diagonally upward extending arms with one arm in each pair pivotally joined with the corresponding arm in the other pair to form a pair of axially aligned scissors joints, said bucket having hold line and improved close line reeving means, said hold line reeving means comprising sheave means disposed in a frame of box-like construction interposed between the support structure and the bucket, bucket support cables secured to the four corners of the frame and to the respective corners of the bucket, a hold line reeved about said sheave means, said hold line having a live end and a dead end, said live end being wrapped about hoist means mounted on the support structure and said dead end anchored to the support structure, and said improved close line reeving means comprising:

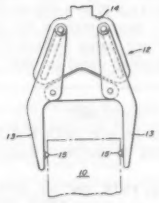
a. first sheave means including at least two sheaves rotatably disposed between the upper ends of said first pair of arms;
b. second sheave means including a sheave rotatably disposed between said first pair of arms below said first sheave means and above the respective scissor joints;
c. third sheave means including at least two sheaves rotatably disposed between the upper ends of said second pair of arms;
d. fourth sheave means including a sheave rotatably disposed between said second pair of arms below said third sheave means and above the respective scissor joints; and
e. a close line, having a live end wrapped about hoist means on the support structure and a dead end secured to the support structure, said close line being reeved successively about the sheave of the second sheave means, alternately about the sheaves of the first and third sheave means and then about the sheave of the fourth sheave means, whereby when a pulling force is exerted on the live end of said close line, tension is exerted in the close line and transmitted through the close line to the dead end of the close line, whereby the arms pivot about the scissors joint to close the bucket.

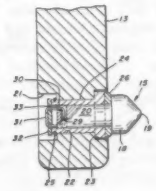
3,975,045

BITS FOR INGOT TONGS

Eugene V. Abarotin, Franklin Township, Westmoreland County, and Michael A. Buckiso, Whitehall Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1975, Ser. No. 553,764
Int. Cl.² B66C *1/48*
U.S. Cl. 294—86 R **15 Claims**



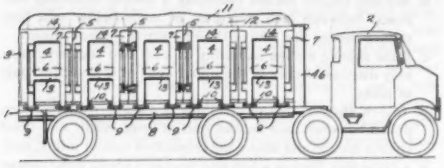


1. A bit for ingot tongs, said bit comprising a cylindrical head, a single blunt conical point, and a cylindrical or slightly tapered shank all formed as an integral casting, said shank having an end opposite said head, a transverse hole and lengthwise grooves in its outer surface extending from the ends of said hole to the end of said shank, said hole being adapted to receive a rod and said grooves to receive bent portions of the rod to serve as fastening means for the bit.

3,975,046
TRUCK BED PANELS

Joseph Andre Raymond Dutil, 55 LaCroix Boulevard, St. Georges, Quebec, Canada (G5Y 1K2)

Filed Oct. 1, 1974, Ser. No. 511,477
Int. Cl.² B62D *25/02*
U.S. Cl. 296—28 M **19 Claims**

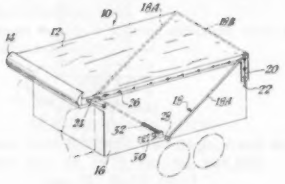


1. A removable truck bed enclosure comprising a plurality of interlockable panels, each of the panels having:
   1. an essentially continuous panel surface having longitudinal lowermost and uppermost edges spaced apart a distance consistent with the intended height of the side of the removable enclosure, and having transverse edges spaced apart a distance consistent with providing a panel of a weight which can be manually transported by no more than two men;
   2. a pair of longitudinally extending enclosed channels disposed on the panel surface and forming a part of the continuous panel surface with the lowermost end and the uppermost end of the enclosed channels near the lowermost edge and uppermost edge, respectively, of the panel surface, and each of the enclosed channels being spaced from the respective transverse edges of the panel surface and from each other;
   3. a rigid mounting member disposed within each of the enclosed channels and having a protrusion which extends out of the lowermost end of the enclosed channel and is receivable in a locking means mounted on a truck bed for locking the panel to the truck bed, said mounting member extending into the enclosed channel; and
   4. cooperating interlocking means disposed near the transverse edges of the panel surface for interlocking the transverse edge of one panel surface to the transverse edge of the next abutting panel surface.

3,975,047
AUTOMATIC DUMP TRUCK COVER

Donald McClellan, 9039 Woodridge Road, Mentor, Ohio 44060

Filed Sept. 2, 1975, Ser. No. 609,507
Int. Cl.² B60P *7/04*
U.S. Cl. 296—100 **4 Claims**

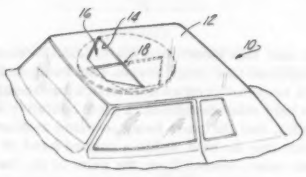


1. A covering mechanism for covering a truck bed comprising:
   - a flexible cover, said cover affixed at one end to said truck bed;
   - a bail, said bail connected to the free opposite end of said cover;
   - an actuating rod connected to the truck bed and to the free ends of said bail;
   - a tensioning spring coupled to said actuating rod;
   - a lever rigidly fixed to said actuating rod;
   - a bail locking means connected to said lever;
   - a solenoid valve in fluid communication with said hydraulic cylinder;
   - a pair of flexible lines, each one coupled on opposite lateral sides of said flexible covering, said flexible lines attached at their ends to said truck bed; and
   - a cable connected at one end to said lever and at the opposite end to said truck bed whereby when said truck bed is raised during the dumping operation said cover including said bail will be moved from a closed position to an open position.

3,975,048
ROTARY SUNROOF FOR AN AUTOMOTIVE VEHICLE

Edward J. Matusek, 4128 N. Main St., Royal Oak, Mich. 48073

Filed Apr. 15, 1974, Ser. No. 460,814
Int. Cl.² B60J *7/08*
U.S. Cl. 296—137 B **7 Claims**



1. A vehicle having a driver's compartment and a passenger's compartment adjacent said driver's compartment, said vehicle also having a roof and floor, an aperture disposed in said roof above both said compartments for admitting light and fresh air into said compartments, a panel rotatably attached to said roof about an axis substantially perpendicular to both said roof and said panel, said panel being rotatable between a first position totally obstructing said aperture, a second position obstructing only the portion of said aperture above said passenger's compartment, a third position obstructing only the portion of said aperture above said driver's compartment and a fourth position opening the aperture above both said compartments,
   - control means connected to said panel for selectively, rotatably moving said panel to thereby control the amount of obstruction of said aperture, and
   - an elongated downwardly extending panel support member disposed along the axis of rotation of said panel, the lower end of said support member being engageable with the floor of said automotive vehicle and the upper end being engageable with said panel.

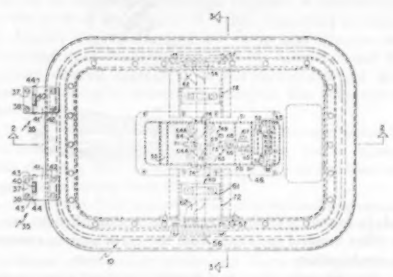
3,975,049
EMERGENCY ESCAPE HATCH ASSEMBLY FOR VEHICLES

Adam Niessner, Winnipeg, Canada, assignor to Motor Coach Industries Limited, Winnipeg, Canada

Filed Jan. 24, 1975, Ser. No. 543,865
Int. Cl.² B60J *7/04*
U.S. Cl. 296—137 B **8 Claims**

1. An escape hatch assembly for use in a vehicle roof which includes a substantially rectangular escape opening in said roof defined by roof panel edges; said escape hatch assembly comprising a substantially rectangular panel component having an upper side and a lower side and including an upper substantially planar panel and a lower panel spaced therefrom, engageable within said opening, overlapping edge flanges formed on the upper side of said component having dimensions larger than the dimensions of the escape opening, down-

ward flanges formed on said overlapping edge flanges, resilient sealing means on said roof adjacent said roof panel edges defining said escape opening, engageable by the lower edges of said down turned flanges when in the closed position, hinge means operatively connecting said component by one side thereof to adjacent one edge of said panel defining said escape opening, and manually operable over center locking and release means on the underside of said escape hatch cooperating with opposite side edges of said escape opening to hold said escape hatch component in closed sealed relationship within said escape opening when in one position and to release said escape hatch component for upward hinging motion when in another position, said locking and release means comprising a ramp and a locking-shaft-receiving portion at one end



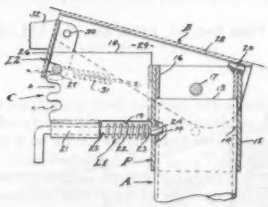
thereof, secured to each side of said escape opening, a locking shaft journalled transversely to the underside of said hatch component, cranked ends on said shaft engagable with said ramp and said locking-shaft-receiving portion, a crank located between the ends of said shaft, an operating handle pivoted by one end thereof to the underside of said hatch component and over center linkage operatively connected between said handle intermediate the ends thereof and to said crank, said handle being movable from an open position whereby said cranked ends are disengaged from said locking-shaft-receiving portion, to a position substantially flush with said hatch component whereby said cranked ends are engaged within said locking-shaft-receiving portions and detachably held therein by said over center linkage.

3,975,050

TILTING SWIVEL CHAIR SUPPORT

Dale P. McKee, 1722 Armstead, Grand Prairie, Tex. 75050

Filed May 14, 1975, Ser. No. 577,414
Int. Cl.² A47C *1/02, 3/00*
U.S. Cl. 297—328 **6 Claims**



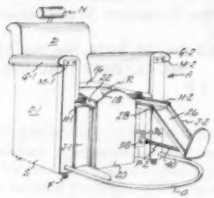
1. A reclinably adjustable seat support including, a mounting for supporting engagement with the underside of a seat and having laterally spaced longitudinal flanges depending therefrom carrying spaced fore and aft pivot pins extending therebetween, a pedestal supported member carrying the aft pivot pin and having a vertically disposed stop plate with an upper edge engageable with the underside of the mounting to limit the normal position of the mounting to the pedestal supported pivot, the stop plate projecting forwardly from said member and having a series of angularly displaced notches faced forwardly at a radius substantially the same as the distance between said pivot pins, and a recline latch comprised of a shackle rotatable on the fore pivot pin and having spring means biasing a toggle pin carried at its moveable end into releasable engagement with any one of said series of notches to lock the mounting in position to the pedestal supported member.

3,975,051

ORTHOPEDIC CHAIR

Robert V. Ballagh, 370 Santa Ana Ave., Long Beach, Calif. 90803

Filed Mar. 8, 1976, Ser. No. 664,819
Int. Cl.² A47C *7/50*
U.S. Cl. 297—434 **3 Claims**



1. An orthopedic chair for a user suffering from arthritis or like disease that includes:

a. a chair frame that includes a pair of laterally spaced walls that support a pair of arm rests, a back rest that extends between said walls, a saddle-shaped seat disposed forwardly of said back rest and that extends between said side walls, said walls, back rest and seat cooperating to define a confined space, said confined space being in communication with first and second laterally spaced passages that extend forwardly therefrom and are located below said seat;

b. first and second parallel, laterally spaced channels movably disposed in said first and second passages adjacent said seat, said first and second channels each having a first forwardly disposed end;

c. first means slidably supporting said first and second channels from said frame;

d. first and second L-shaped leg supports pivotally secured to said first ends of said channels and longitudinally aligned with said first and second passages;

e. first and second reversible electric motors disposed in fixed positions in said confined space;

f. first and second tubular members that may be driven by said first and second electric motors, said tubular members disposed in said first and second passages, said first and second tubular members having first and second internal threads on at least the forward portions thereof;

g. first and second bearings secured to said frame that rotatably support said tubular members;

h. first and second externally threaded rods that engage said first and second internal threads in said first and second tubular members, said first and second rods having forwardly disposed ends;

i. first and second hollow guides secured to said first and second leg supports and disposed longitudinally thereto;

j. first and second slides movable in said first and second guides, said forward ends of said first and second rods pivotally connected to said first and second slides;

k. a source of electric power;

1. an electric circuit for supplying electric power from said source to said first and second electric motors; and

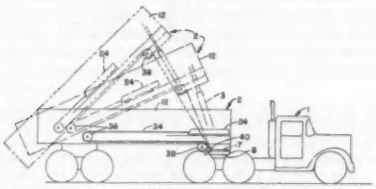
m. manually operable electric switch means adjacent said arm rests for selectively completing said circuit to either of said electric motors to cause the latter to rotate in either a first or second direction, said first or second electric motors when rotating in a first direction moving said first or second rod rearwardly to pivot said first or second leg support downwardly, said first or second electric motors when rotating in a second direction moving said first or second rods forwardly to pivot said first or second leg support upwardly, said first and second leg supports when such pivotal movement takes place supporting the portions of the user's legs beneath the knees, and said seat and first and second channels the portions of said users legs above the knees.

3,975,052

DEVICE TO STABILIZE A DUMP BODY VEHICLE ON LATERALLY ANGULATED TERRAIN BY MOVEMENT OF THE CONTENTS DURING THE ELEVATION THEREOF

Charles Cee Pitts, Bridgeport, Tex., assignor to Hazel Y. Pitts, Ryan, Okla.

Filed Feb. 19, 1975, Ser. No. 551,041
Int. Cl.² B60P *1/00, 1/16*
U.S. Cl. 298—1 B **7 Claims**



1. In an unloader for the dump body of a vehicle, which dump body has sides, a bottom, a closed front end and a rear end gate,

a. a material mover element extending transversely across the dump body of the vehicle and, when positioned at the forward end, being on the bottom thereof and extending upwardly less than the depth of the material to be dumped,

b. pull means connected to the rear side of said material mover element and extending rearwardly of the dump body,

c. power means connected to said pull means to move said material mover element rearwardly,

d. further pull means connected to the opposite side of said material mover element,

1. said power means connected to said further pull means to retract said material mover element,

2. said power means for elevating said dump body comprising a hydraulic cylinder, connected to a source of hydraulic fluid under pressure, said cylinder having the lower end thereof pivotally mounted on the vehicle and having the upper end thereof pivotally connected to the forward end of the dump body,

e. a track comprising a pair of spaced apart, parallel members mounted on the bottom of said dump body and extending longitudinally thereof,

1. said material mover element being movably mounted on said track in guided relation,

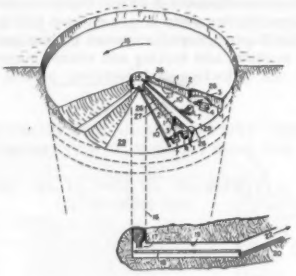
f. each said track member being angulated upward from the bottom of the dump body at the forward end toward the rear end of said dump body so that the movement of said material mover element on said track will be upwardly so as to loosen the material being dumped from said dump body.

3,975,053

MINING METHODS AS SUCH AND COMBINED WITH EQUIPMENT

Boris J. Kochanowsky, 426 Homan Ave., State College, Pa. 16801

Filed Dec. 3, 1973, Ser. No. 420,886
Int. Cl.² E21D *1/03;* E21F *13/00;* E21C *41/06, 47/00*
U.S. Cl. 299—7 **6 Claims**



1. In a mining method for the extraction of rock, ore, coal or other mineral materials from the earth's crust, comprising in combination:

a turning-point area, said turning-point area having two or more shafts for storage and depositing said mineral material to create a buffer in haulage between the loading point at the bench and the point of final destination of mined material;

a bench from said turning-point area proceeding radially and positioned on an area to be mined;

a transportation tunnel connected to said shafts;

means to transport mined minerals material through said tunnel to outside, the process comprising in combination:

mining said bench which is radially positioned and which rotates about said turning-point area in a downwardly sloping screw-shaped path;

depositing mined or mineral material of different quality in different shafts and blending the deposited mined material from these shafts at the emptying point of said shafts in said tunnel;

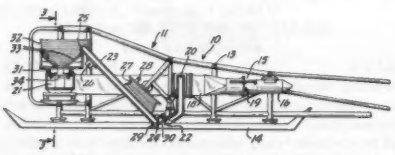
removing said mined mineral material from said shafts through said tunnel.

3,975,054

UNDERSEA MINING AND SEPARATING VEHICLE HAVING MOTOR-POWERED WATER JET

Frank Howard Brockett, III; James E. Philp, both of Bellevue, and Arthur Francis Sullivan, Redmond, all of Wash., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,754
Int. Cl.² E02F *3/94, 7/00*
U.S. Cl. 299—8 **9 Claims**



1. An undersea mining vehicle for obtaining and concentrating desired sizes of mineral aggregates from a path of preselected width on an undersea floor area where desired aggregates are dispersed in a mixture with other solid materials at the surface of an undersea floor comprising:

a. a vehicle structure including a framework mounted on downward-facing supporting surfaces and adapted for being moved in a forward direction on a soft undersea floor;

b. a nozzle for directing a pressurized sheet-jet of water rearwardly downward, and extending laterally, near the sea floor when the downward facing surfaces are supported by the sea floor;

c. an enclosed ramp inclined rearwardly upward and adapted to be disposed with the ramp entrance behind the jet and at least as high as the level of the downward-facing supporting surfaces and in a collecting position for receiving water and sea floor solids, including desired sizes of mineral aggregates, driven by the jet;

d. means for maintaining the ramp entrance at least as high as the level of the downward-facing supporting surfaces;

e. a hopper disposed behind the ramp and adapted for receiving desired aggregates from the ramp exit and directing desired aggregates to fall downward and also having opening for exhausting undesired fine solids out of the vehicle;

f. a trough below the hopper, said trough being adapted to receive aggregates falling from the hopper and to receive and direct a flow of water transversely to the flow of aggregates falling from the hopper;

g. a conveyance duct to carry a flow of water and aggregates from the trough to a place where delivery of aggregates is desired; and

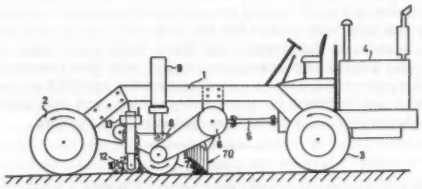
h. hydraulic pressurizing means and ducting for providing pressurized flows of water through the sheet-jet nozzle and through the trough.

3,975,055

APPARATUS FOR MILLING ROAD SURFACES

Reinhard Wirtgen, Hohner Strasse, 5461 Windhagen, Germany

Division of Ser. No. 244,775, April 17, 1972, Pat. No. 3,829,161. This application May 6, 1974, Ser. No. 466,966
Claims priority, application Germany, Apr. 16, 1971, 2118458
Int. Cl.² E01C *23/09*
U.S. Cl. 299—39 **11 Claims**



1. Apparatus for milling road surfaces comprising:

a rigid movable chassis provided with wheels for supporting and moving it on a road surface and means for driving at least some of said wheels;

a rotatable roller carrying hard-metal cutters thereon;

means for mounting said roller at each end in a vertically adjustable position with respect to said chassis including at least one vertically adjustable support wheel, each such support wheel (12), being provided with jack means for support height adjustment in relation to the road surface; and

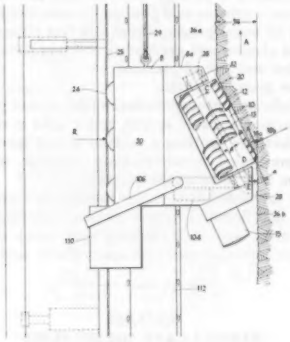
means for rotating said roller in a direction of rotation opposing forward traction of the chassis wheels when said cutters engage said road surface during rotation of said roller and forward movement of said chassis.

3,975,056

LONGWALL CANTED DRUM MINING MACHINE

Carl R. Peterson, Boxford, Mass., assignor to Rapidex, Inc., Gloucester, Mass.

Filed Feb. 11, 1974, Ser. No. 441,418
Int. Cl.² E21C *27/24*
U.S. Cl. 299—42 **8 Claims**



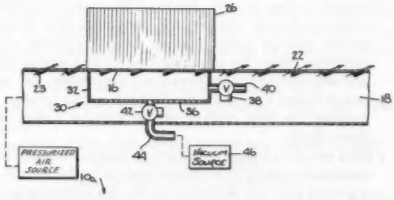
1. A side excavating machine comprising a rotatably driven cylindrical drum adapted to advance generally endwise along a pre-existing working face, but angled so that trailing portions of the drum project beneath the plane of the pre-existing face, said drum having a distribution of rock cutting rollers on its cylindrical surface which are freely rotatable about their rolling axes, said rolling axes being fixed in a predetermined relation to the axis of said drum defining a small forward skew angle, a frame adapted to advance along said working face, said cylindrical drum being rotatably mounted by bearings on said frame with the drum axis lying at a small acute angle to the direction of advance so that said trailing portions of the drum excavate rock as the frame advances along the face, the major component of rock-cutting forces thereby applied to the drum being normal to the direction of advance of said frame, means to provide side reaction force to said frame corresponding to said major component of rock-cutting forces, and said fixed axis skewed rollers in rolling action upon the rock adapted to generate a force assisting in the forward advance of said cutting rollers.

3,975,057

STOPPING DEVICE FOR AIR CONVEYOR

Stanley E. Hurd, Sunnyvale, Calif., assignor to The Motch & Merryweather Machinery Company, Hayward, Calif.

Filed Feb. 6, 1975, Ser. No. 547,667
Int. Cl.² B65G *51/02, 53/58*
U.S. Cl. 302—31 **2 Claims**



1. An article conveying apparatus comprising:

a conveyor deck defining a conveyor path and having a plurality of openings therein, said openings being arranged along said deck and being configured to issue air jets having horizontal flow components along said conveyor deck for conveying the articles along said path,

a first plenum chamber underlying said conveyor deck for supplying air under pressure through said openings to establish said air jets,

means for supplying pressurized air to said first plenum chamber,

stopping means comprising a second plenum chamber located within said first plenum chamber at a selected location underlying a selected number of said openings,

means defining a passage between said first and second plenums, a valve in said passage for selectively communicating air under pressure from said first plenum into said second plenum and preventing communication between said first and second plenums,

a vacuum pressure source,

means defining a passage between said second plenum and said vacuum pressure source, and a valve in said passage for selectively applying a vacuum in said second plenum and preventing communication between said second plenum and said vacuum source,

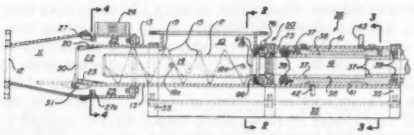
whereby said selected openings function to convey articles when said first and second plenums communicate with each other and as a stopping zone when said second plenum communicates with said vacuum source.

3,975,058

PARTICULATE SOLIDS PUMP

Leonard R. York, Denver, Colo., assignor to Lafayette Engineering & Manufacturing, Inc., Denver, Colo.

Filed May 12, 1975, Ser. No. 576,875
Int. Cl.² B65G *53/48*; F16J *15/54*
U.S. Cl. 302—50 **23 Claims**



18. A sealing apparatus for a rotatable shaft, comprising:

a first sealing member having an aperture formed therein for concentrically fitting in a closely spaced radial manner from the shaft, and further including a receptacle adjacent to and concentric with said shaft and facing in a first lateral direction along said shaft;

an annular collar carried by and sealed against the shaft and having a first surface facing laterally in the first direction and a second surface for fitting concentrically within and closely radially spaced from the receptacle of said first sealing member;

a second sealing member having a lip portion including an aperture formed therein for concentrically fitting in a closely spaced radial manner from the shaft and also including means for retaining said second sealing member laterally adjacent said first sealing member, the lip portion defining means for providing a grease retainer intermediate the first surface of the annular collar and the drive shaft;

a third member having an aperture formed therein for concentrically fitting in a closely spaced radial manner from the shaft and also including means for retaining said third member laterally adjacent said first sealing member, said third member also providing in conjunction with said first member a sealing reservoir adjacent the shaft;

means for providing grooves in the shaft adjacent the sealing reservoir; and,

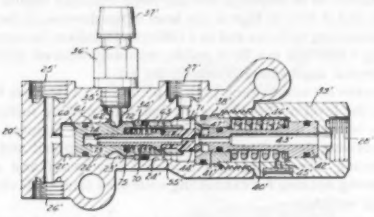
means for providing sealing material in the sealing reservoir.

3,975,059

BLEND BACK PROPORTIONING VALVE

Edward S. Orzel, Cleveland, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Division of Ser. No. 419,998, Nov. 29, 1973. This application Dec. 15, 1975, Ser. No. 640,864
Int. Cl.² B60T *8/26*, *17/22*
U.S. Cl. 303—6 C **7 Claims**



5. A blend back proportioning valve comprising a housing having an inlet port, and outlet port, a bore in said housing between said inlet port and said outlet port, proportioning piston means slidably disposed in said bore between said inlet port and said outlet port, said proportioning piston means having a smaller lateral cross-sectional area exposed to inlet port pressure and a larger lateral cross-sectional area exposed to outlet port pressure, a fluid flow passage extending between said inlet port and said outlet port, said proportioning piston means including a valve member, blend back spool means slidably disposed in said bore, said blend back spool means including a valve seat, said valve seat being spaced from said valve member to open said fluid flow passage when the fluid pressure in said inlet port is less than a first predetermined pressure, said proportioning piston means moving said valve member to a position adjacent said valve seat to at least partially close said fluid flow passage when said first predetermined pressure is reached, said proportioning piston means maintaining increases in outlet port pressure proportional to but less than increase in inlet port pressure when said inlet port pressure is greater than said first predetermined pressure and is less than a second predetermined pressure, said blend back spool means moving said valve seat away from said valve member when said second predetermined pressure is reached in said inlet port to equalize the fluid pressures in said inlet port and said outlet port, said blend back spool means includes a first end portion adjacent said valve seat exposed to inlet port pressure and a second end portion spaced from said valve seat exposed to outlet port pressure, and seal means isolating said second end from said inlet port pressure.

3,975,060

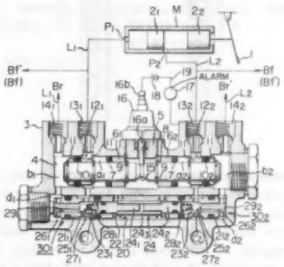
FLUID PRESSURE CONTROL DEVICE WITH A FAILURE ALARM FOR A VEHICLE BRAKE SYSTEM

Itaru Hirayama, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed May 14, 1975, Ser. No. 577,787
Claims priority, application Japan, May 18, 1974, 49-55730
Int. Cl.² B60T *8/26*, *17/22*
U.S. Cl. 303—6 C **1 Claim**

1. In a vehicle brake system of the type including a dual brake master cylinder having a first and a second independent output port and a first and a second hydraulic fluid line extending from said respective first and second output ports of said brake master cylinder and connected to the respective hydraulic fluid chambers of a pair of left and right rear wheel brakes, a fluid pressure control device with a failure alarm comprising: a casing arranged across said first and second hydraulic fluid lines midway thereof and defining a cylinder bore; a pair of first and second annular pistons slidably fitted in said cylinder bore; a position defining member arranged on

said casing to extend into the middle portion of said cylinder bore to define a minimum axial distance between said annular pistons; a balance piston extending axially through said annular pistons in sliding relation thereto and having a central portion formed to be embraced by said annular pistons; a pair of sealing members fixedly mounted on the opposite end portions of said balance piston so as to define in said cylinder bore a first and a second pair of upstream and downstream hydraulic chambers in cooperation with said balance piston as assuming a neutral position embraced by said annular pistons, said upstream and downstream hydraulic chambers in said first pair respectively communicating with the upstream and downstream portions of said first hydraulic fluid line, said upstream and downstream hydraulic chambers in said second pair respectively communicating with the upstream and down-



stream portions of said second hydraulic fluid line; means for placing said upstream and downstream hydraulic chambers in each pair in communication with each other as said balance piston assumes an end position remote from such hydraulic chambers; a first and a second control valve arranged between said first pair of upstream and downstream hydraulic chambers and between said second pair of upstream and downstream hydraulic chambers, respectively, and each operable to reduce the fluid pressure in said downstream hydraulic chamber relative to that in said upstream hydraulic chamber at a predetermined ratio; a switch unit mounted on said casing and operable in response to axial displacement of said balance piston from the neutral position thereof to operate an external alarm; said first and second control valves comprising: a second cylinder bore formed in said casing separate from and in parallel with the first-mentioned cylinder bore, a pair of first and second control pistons slidably fitted in said second cylinder bore, a first and a second input fluid chamber respectively defined on the inner ends of said first and second control pistons in fluid communication with said respective upstream hydraulic chambers in said first cylinder bore, a first and a second output fluid chamber respectively defined on the outer ends of said first and second control pistons in fluid communication with said respective downstream hydraulic chambers in said first cylinder bore and imparting to said first and second control pistons an area of fluid thrust larger than that imparted thereto by said first and second input fluid chambers, a first and a second valve element arranged between said first input and output fluid chambers and between said second input and output fluid chambers, respectively, so as to be positioned to intercommunicate the adjacent input and output fluid chambers as the associated control piston is moved to the outer end position thereof and to break communication between the adjacent input and output fluid chambers as the associated control piston is moved to the inner end position thereof, and a pressure setting spring arranged under compression between said first and second control pistons; a second balance piston arranged axially in said second cylinder bore, said first and second control pistons being formed in their respective inner end faces with axial bores to define therein said first and second input fluid chambers with the opposite end portions of said second balance piston slidably fitted in said respective axial bores.

3,975,061

POWERED BRAKE SYSTEM FOR VEHICLES

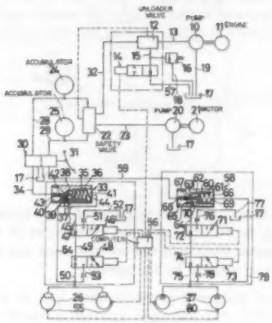
Toshiyuki Kondo, and Takumi Nishimura, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 29, 1974, Ser. No. 474,215

Claims priority, application Japan, May 29, 1973, 48-60032

Int. Cl.² B60T *8/04*

U.S. Cl. 303—21 AF **7 Claims**



2. A powered brake system for vehicles comprising:

wheel brake cylinders;

a pump powered hydraulic pressure source;

a reservoir hydraulically connected to said pump powered hydraulic pressure source;

control valve means interposed between said wheel brake cylinders and said pump powered hydraulic pressure source for controlling the fluid pressure to said wheel brake cylinders;

valve means interposed between said reservoir and said control valve means for connecting said wheel brake cylinders to either one of said reservoir and said control valve means; and

orifice valve means interposed between said control valve means and said valve means for slowly and rapidly supplying the fluid pressure from said control valve means to said valve means in accordance with the pressure difference between said control valve means and one of said wheel brake cylinders under anti-skid conditions of said vehicle,

wherein said valve means includes a main control valve electromagnetically actuated according to the skid condition of said wheel brake cylinders and a by-pass valve electromagnetically actuated according to the skid condition of said wheel brake cylinders.

3,975,062

DEVICE FOR LIMITING BRAKE PRESSURE ACCORDING TO VEHICLE LOAD AND DECELERATION

Jean Louis Giordano, Noisy-le-Roi, and Michel Guettier, Rueil, both of France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of France

Filed May 6, 1974, Ser. No. 467,226

Claims priority, application France, May 24, 1973, 73.18991

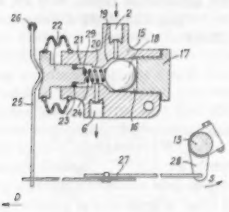
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.² B60T *8/18, 8/24, 8/26*

U.S. Cl. 303—22 R **3 Claims**

1. In a braking pressure limiting device having a limiter body with a fluid inlet orifice, a fluid outlet orifice, means responsive to the load of the vehicle and an arm connected to the said load-responsive means, a valve comprising a piston slidably mounted in the body of the limiter, one end of the

piston engaging an arm connected to the load responsive means, the other end of the piston being operatively connected to a spring mounted in compression between the piston



and an inertia mass, said mass being a ball, said spring exerting the controlling force opposing the movement of the ball as long as the inertia force exerted by ball does not exceed the controlling force exerted by the spring.

3,975,063

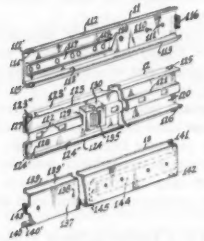
PROGRESSIVE SLIDE ASSEMBLY

Hans Mahotka, and Manfred Glastetter, both of Anaheim, Calif., assignors to NL Industries, Inc., New York, N.Y.

Filed May 12, 1975, Ser. No. 576,870

Int. Cl.² F16C *29/00*

U.S. Cl. 308—3.8 **15 Claims**



1. A progressive slide assembly for supporting a movable component for longitudinal displacement relative to a fixed component said progressive slide assembly comprising: an outer channel member arranged to be secured to a fixed component, an inner channel member arranged to be secured to a movable component, and an intermediate channel member, said channel members dimensioned to be assembled in nested relationship and having overlapping edges arranged to form ball races therebetween, anti-friction means arranged to be mounted in the ball races between said outer channel member and said intermediate channel member and between the latter and said inner chamber member to support said channel members for longitudinal movement relative to each other, said anti-friction means comprising ball bearing retainers consisting essentially of cord-like strips of material having apertures spaced longitudinally thereof and ball bearings freely mounted in said apertures, and positive drive means arranged between the inner movable channel member and said intermediate channel member and between the latter and said fixed outer channel member for effecting positive longitudinal movement of said intermediate channel member progressively with the longitudinal movement of said inner channel member.

3,975,064

BALL BUSHING

Sven Walter Nilsson, Goteborg, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

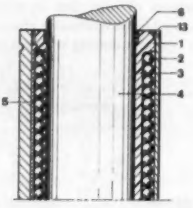
Continuation of Ser. No. 397,206, Sept. 13, 1973, abandoned.

This application May 2, 1975, Ser. No. 573,884

Claims priority, application Sweden, Sept. 15, 1972, 72110904

Int. Cl.² F16C *29/06*

U.S. Cl. 308—6 C **11 Claims**



1. An adjustable ball bushing for use in guiding a central shaft, comprising a sleeve, a cage and a plurality of balls recirculating in channels in said cage between a loaded zone and a load-free zone, said sleeve surrounding said cage, a plurality of spaced longitudinal ridges extending along the length of the periphery of said sleeve, said sleeve having an internal polygonal shape with sections of decreasing strength on either side of said ridges, said ridges and the remaining periphery portion of said sleeve between said ridges being relatively elastic with respect to each other, and a loading strip placed along each ridge, each said loading strip spacing said cage from said sleeve so that there is no sliding friction between said cage and said sleeve, wherein said cage includes a plurality of outer channels in said load-free zone for said recirculating balls, said outer channels positioned within said polygonally internally shaped sleeve along a guiding corner formed by and between adjacent polygonal internal walls of said sleeve.

3,975,065

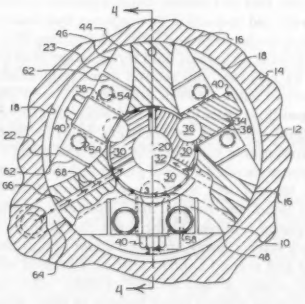
ADJUSTABLE BEARING ASSEMBLY

Homer E. Gravelle, Jefferson, Colo., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 27, 1975, Ser. No. 580,947

Int. Cl.² F16C *17/06*

U.S. Cl. 308—73 **21 Claims**



1. A bearing assembly for supporting a rotatable shaft at a location within a cavity defined by an internal wall, comprising:

a cartridge insertable into the cavity with a support surface in supportable contact with the internal wall and a nonsupport surface spaced from said internal wall;

means for bearing the shaft; and

means for adjustably securing said bearing means to the cartridge including means accessible through the space between the nonsupport surface and said internal wall for manual adjustment thereof.

3,975,066

JOURNAL BEARING

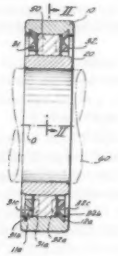
Heinrich Hofmann, and Günter Markfelder, both of Schweinfurt, Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed Aug. 27, 1975, Ser. No. 608,339

Claims priority, application Germany, Aug. 28, 1974, 2441121; Oct. 16, 1974, 2449194

Int. Cl.² F16C *33/38*

U.S. Cl. 308—201 **12 Claims**



1. A journal bearing comprising:

an array of rotary bodies centered on an axis;

annular race means forming a track in contact with said bodies, said race means having two axially spaced annular surface zones coaxial with said array on opposite sides of said track, said zones being provided with respective recesses centered on said axis; and

cage means engaging said bodies for maintaining same at predetermined peripheral distances from one another, said cage means having a pair of axially opposite end faces peripherally bounded by radially projecting resilient formations snap-fitted into said recesses, said cage means and race means together consisting of at least three interfitting coaxial members carrying said formations and recesses for enabling independent interengagement of said formations with said recesses to form a coherent unit with said bodies.

3,975,067

BEARING ASSEMBLIES

Jacques Lucien Joseph Martin, Paris, France, assignor to R.K.S., France

Filed May 14, 1974, Ser. No. 469,635

Claims priority, application France, June 8, 1973, 73.21147

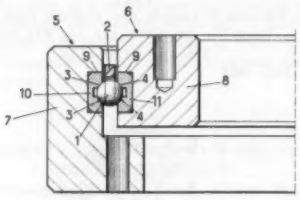
Int. Cl.² F16C *33/58, 33/64*

U.S. Cl. 308—216 **2 Claims**

1. A double contact roller or ball bearing assembly comprising:

two supports one of which has an inner cylindrical surface and the other an outer cylindrical surface, said two cylindrical surfaces having different diameters and said inner cylindrical surface being disposed concentrically within said outer cylindrical surface, said inner cylindrical surface comprising an annular groove extending radially outwardly and said outer cylindrical surface comprising an annular groove extending radially inwardly,

two elastic rings each opened by a single oblique gap, mounted by elastic deformation the one into said outwardly extending groove and the other into said inwardly extending groove, each of said rings being formed from a bearing steel section comprising two enlarged portions joined by a thinner axial rib, each of the two enlarged portions of each ring forming one of the two roller or ball paths forming together the double contact bearing surface of each ring, each ring being tempered on its entire bearing surface turned toward the bearing surface of the other ring, the ring mounted into the inwardly extending



groove of said outer cylindrical surface having an inner circumference smaller than the circumference of said groove at the bottom thereof, but greater than the circumference of said outer cylindrical surface, and the ring mounted into the outwardly extending groove of said inner cylindrical surface having an outer circumference greater than the circumference of said groove at the bottom thereof, but smaller than the circumference of said inner cylindrical surface, said two supports being made from a material less hard than the bearing steel of said open rings.

3,975,068

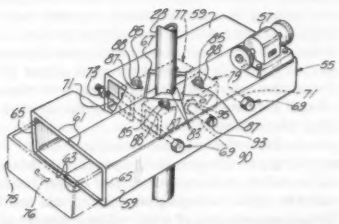
COLUMN MOUNTED TOOL HOLDER

Leonard A. Speckin, 308 Academy, Portland, Mich. 48875

Continuation-in-part of Ser. No. 426,545, Dec. 20, 1973, Pat. No. 3,920,295. This application Sept. 23, 1974, Ser. No. 508,082

Int. Cl.² A47B *9/08*

U.S. Cl. 312—254 **9 Claims**



1. A column mounted tool holder comprising a plurality of complementary structural members each having an upper planar surface and at least one vertical edge having a recessed portion therein, said members adapted to be arranged about a vertical support column with said vertical edges abutting each other and said recessed portions surrounding said column but being spaced therefrom so as to form a continuous upper planar surface about said support column, means for securing the structural members to each other in edge abutting relation about said column so as to be integrated into a unitary tool holder, a plurality of separate clamp members all of which are mounted on the structural members adjacent said recessed portions so as to be arranged in a horizontally spaced relationship about said support column on which the tool holder is to be mounted, each clamp member having a clamp-

ing surface opening toward the column and movable in a direction perpendicular to a plane containing the abutting edges of said structural members, and the clamp members collectively being adapted to engage the support column in clamping engagement therewith so as to support the tool holder on said support column, and means for adjustably positioning at least one of the clamp members so as to permit the tool holder to be clamped on to support columns of varying sizes.

3,975,069

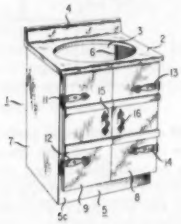
COLLAPSIBLE ENCLOSURE FOR LAVATORIES OR THE LIKE

Philip A. DeLucia, 57 Lincoln Ave., Cliffside Park, N.J. 07010

Filed Dec. 20, 1974, Ser. No. 534,770

Int. Cl.² A47B *43/00*

U.S. Cl. 312—262 **2 Claims**



1. A collapsible housing adapted to house a lavatory basin or the like, comprising in combination:

a. in fully assembled position:

a rectangular front frame constructed to accommodate at least one front panel,

first and second rectangular side panels,

said side panels connected by hinged composites with said front frame,

a bottom panel hinged along the lower horizontal member of said front frame,

said front frame, said side panels and said bottom panel forming between them four sides of a partially enclosed rectangular container,

an elongated stiffening brace of rectangular cross-section which in the fully assembled position of said housing is disposed with its major face parallel to said front frame and normal to said side panels adjacent their rear upper edges, forming a rigid connection locked into position across the open rear of said enclosure between said first and second side panels, the upper edges of said front frame and said side panels forming with the upper edge of said stiffening brace a rectangular support on the top edge plane of said housing;

b. means for collapsing said housing:

comprising on each of said side panels said hinged composite including at least two vertical hinges laterally spaced apart by a free swinging connecting leaf and having two lateral leaves, one of each of said lateral leaves being fastened to the inside face of said front frame in a position adjacent to a respective side edge of said front frame, the other of each of said lateral leaves being fastened to the inside face of the respective side panel adjacent the nearest end of said front frame, the free swinging connecting leaf of the hinged composite between the front frame and said first side panel being slightly wider than the thickness of said bottom panel in folded position, and the free swinging connecting leaf of the hinged composite between said second side panel and said front panel being slightly wider than the combined thickness of said bottom panel together with the thickness of said first side panel, both in folded position, said bottom panel being constructed and arranged to fold inwardly and upwardly against the inner face of said front frame, said first side panel being constructed and arranged to fold inwardly against the folded under face of said bottom panel, and said second side panel being constructed to fold inwardly against the surface of said first side panel in folded position,

a third hinge composite comprising a plurality of vertical hinges spaced apart by connecting leaves, a lateral leaf being connected at each side of said hinge composite, one said lateral leaf fixed to the upper rear edge of said second side panel, and another said lateral leaf disposed to swing freely, a pin fixed to and protruding from the outer surface of said freely swinging lateral leaf, said pin constructed to serve as a pivot for said stiffening brace, said stiffening brace being constructed and arranged to rotate about said pin in a vertical plane,

means for locking said stiffening brace in assembled position with the rear top edge of said first side panel,

whereby when said stiffening brace is unlocked from the upper position it rotates downwardly through an angle of approximately 90° in a vertical plane, and said free swinging lateral leaf is rotated in a horizontal plane about said hinges to plane the major surface of said stiffening brace in a position coplanar with said second side panel, as said side panel is folded into place against the folded surface of said first side panel, forming a completely folded composite.

3,975,070

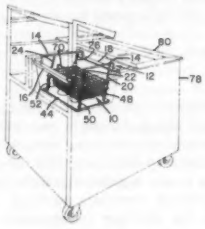
FLOUR AND BATTER APPARATUS

John F. Barteau, Boerne; George J. King, and August M. Saenz, both of San Antonio, all of Tex., assignors to Church's Fried Chicken, Inc., San Antonio, Tex.

Filed Apr. 10, 1975, Ser. No. 566,913

Int. Cl.² A47B *88/00;* **A47J** *29/02*

U.S. Cl. 312—322 **6 Claims**



1. An apparatus for coating food with a batter contained in a pan in preparation for frying, said apparatus comprising:

stationary upper support means mounting on said pan containing the batter;

leg means attached to and extending generally downward from stationary upper support means;

vertically movable frame means slidably carried on said leg means;

basket means pivotally connected to and carried by said vertically movable frame means, said basket means being adapted to pivot relative to said frame means when in an upward position, said basket means having a stop means to prevent pivotal movement beyond a predetermined point, said basket allowing free flow of batter therethrough; and

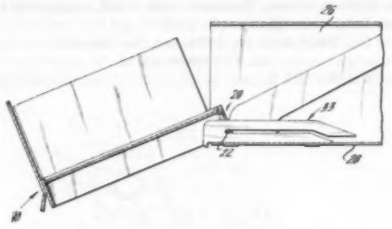
spring means connected to said vertically movable frame means urging said vertically movable frame means and basket means upward from the batter and normally holding said basket means near an uppermost position.

3,975,071

FILE CABINET CONSTRUCTION

David A. Quinn, Brooklyn, N.Y., assignor to Supreme Equipment & Systems Corporation, Brooklyn, N.Y.

Filed Oct. 22, 1974, Ser. No. 516,847
Int. Cl.² A47B 88/06
U.S. Cl. 312—323 19 Claims



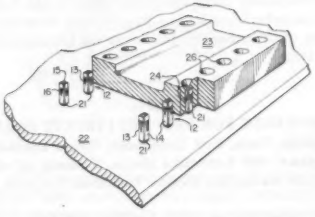
1. A cabinet construction including:
a housing;
at least one shelf mounted within said housing;
guide means mounted on said shelf, said guide means including a rail member having its transverse axis perpendicular to said shelf, and including a longitudinal slot extending into said member from a first end and lying in a plane perpendicular to said shelf;
at least one container, said container including a bottom wall and two opposed longitudinal side walls attached to said bottom wall; said bottom wall of said container including a longitudinally extending channel configured to fit slidably over said guide means; and
mounting means attached to said container, said mounting means including an elongated member which is mounted transversely across said channel and arranged to cooperate with said slot in said rail member to detachably mount said container on said shelf.

3,975,072

LOW PROFILE INTEGRATED CIRCUIT CONNECTOR AND METHOD

John Preston Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas County, Tex.

Filed Apr. 15, 1974, Ser. No. 460,931
Int. Cl.² H01R 9/16; H05K 1/11
U.S. Cl. 339—17 LC 24 Claims



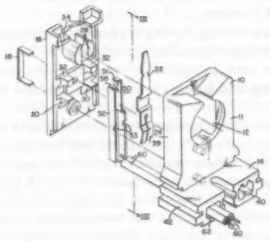
1. A connector for electrical components having conductive leads extending therefrom, comprising:
a planar substrate having aligned contact receiving holes therein;
a plurality of longitudinally rigid contacts having a central portion for press-fitting into the holes in said substrate, said contacts each having a socket portion, said socket portion having a flat top edge surface and a top opening for receiving a component lead; and
a removable insulative housing having a plurality of recesses formed therein with bottom openings of sufficient size to receive the socket portions up into said recesses, top openings for receiving component leads, and a generally flat seating region within each recess surrounding each top opening, said socket portions being placed up into said recesses to substantially enclose the socket portions thereof with the flat top edge surface of each contact in an abutting relationship with the generally flat seating region within each respective recess, and the central portion of each contact protruding from said bottom openings of said housing to transmit force applied to the top surface thereof to said contacts to press-fit the central portions thereof into said apertures and to receive component leads into the top openings for electrically conductive engagement with the interior of each respective contact socket portion.

3,975,073

FLUORESCENT LAMPHOLDER WITH MEANS FOR CIRCUIT INTERRUPTION

Emmett J. McLaughlin, Fairfield, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1971, Ser. No. 204,285
The portion of the term of this patent subsequent to Apr. 4, 1989, has been disclaimed.
Int. Cl.² H01R 33/08
U.S. Cl. 339—53 5 Claims



1. An electrical receptacle particularly suitable for holding and connecting for electrical energization the contact pins of a lamp, such as a fluorescent lamp, and opening a circuit upon lamp removal, said receptacle comprising: a housing including a front body member and a back cover member; said front body member having a front wall with an opening therein to receive contact pins, side walls extending rearwardly from said front wall, a central spacer extending rearwardly from said front wall located between and spaced from said side walls to define a pair of recesses; said back cover member having a plurality of frontwardly extending projections including pin guides extending within said opening in said front wall, and contact member locating projections extending within said recesses; a first contact means for a first contact pin, said first contact means comprising a single member located in one of said recesses and having a pin-contacting portion extending across said opening for contacting a contact pin; a second contact means for a second contact pin, said second contact means comprising a pair of members located in the other of said recesses including a first member having a pin contacting portion extending across said opening for contacting a contact pin and a second member adjacent said first member and contacted by said first member only when said first member is laterally deflected, said first member pin contacting portion being substantially perpendicular with said first wall and having pin locating means thereon; said first and second members of said second contact means both being thin metal elements of which a principal portion of each extends substantially parallel to said side walls and has a front edge with a notch in

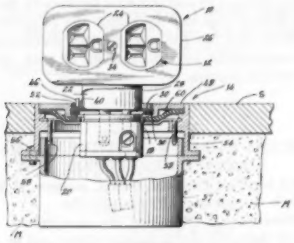
which is engaged a projection from the inner surface of said front wall.

3,975,074

STANDING BOX FOR ELECTRICAL FIXTURES

Alvin Walter Fuller, Shelton, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Apr. 4, 1975, Ser. No. 565,052
Int. Cl.² H01R *13/54*; H02G *3/08*
U.S. Cl. 339—89 R **3 Claims**



1. The combination of a standing box unit and a floor box unit and gasket means for sealing both units when the units are connected together, the standing box unit comprising:

a housing mounting at least one electrical convenience outlet thereon;

an electrical plug having a plurality of electrically conductive prongs extending therefrom;

a hollow stem joined at a first end to the underside of said housing and having a second, open end for housing the plug;

a circular flange at the second end of said stem extending radially outwardly therefrom and having an outer diameter substantially equal to that of the gasket;

a passageway common to said first end of said stem and the interior of said housing for allowing passage of wiring connections between the convenience outlet and the plug and insulated wires for electrically connecting said outlet to said plug;

the underside of said housing including a plurality of openings disposed outwardly of said passageway but encompassed within said stem, a plurality of plug-retaining elements passing axially into said stem through said openings;

said plug including a plurality of openings axially aligned with the openings in said housing in which said retaining elements are secured, whereby the plug is affixed in said stem to said housing with the prongs of the plug extending along said axis and projecting beyond said flange of said stem;

an externally-threaded collar loosely mounted on said stem between the underside of the standing box and said flange, said collar having an internal diameter less than the external diameter of said flange;

the floor box unit including an outwardly-facing receptacle mounted fixedly below the surface of a floor in which the floor box unit is mounted;

a flat floor plate mounted fixedly to the floor box unit substantially flush with said surface, said floor plate having an internally threaded portion adjacent the upper surface thereof and an annular shoulder portion inwardly of said threaded portion;

said shoulder portion supporting the gasket thereon;

the external threads of said collar mating with the internal threads of said floor plate;

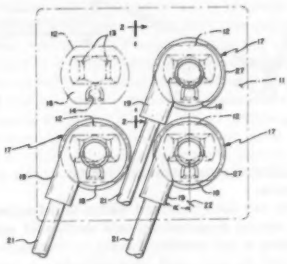
means disposed on a portion of the surface of said collar which projects above the floor surface for facilitating rotation of said collar into said floor plate, whereby rotation of said collar drives said flange axially to compress the gasket with minimum torsional stresses against said shoulder portion of said floor plate and thereby effect a sealed, threaded mounting of the standing box unit to the floor box unit.

3,975,075

UNITARY OFFSET WALL PLUG

John Richard Mason, Thousand Oaks, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed Sept. 18, 1974, Ser. No. 506,954
Int. Cl.² H01R *13/58*
U.S. Cl. 339—102 R **3 Claims**



1. A wall plug for insertion in a multi-receptacle outlet box having a rectangular receptacle pattern, comprising

a unitary body member of generally cylindrical shape,

a flat face on one end of said body oriented substantially perpendicular to the cylindrical axis thereof,

a pair of electrical contacts extending from said flat face, adapted for insertion in a standard electrical wall receptacle,

a ground contact extending from said flat face at a point equidistant from said electrical contacts,

a strain-relief sleeve extending tangentially from the periphery of said body in a direction forming an actue angle with a line parallel to the plane of said flat face and equidistant from said electrical contacts, said strain relief sleeve being spaced from the plane of said flat face thereby clearing protrusions above the face of the rectangular array,

and a multi-conductor cable passing through said strain-relief sleeve to the interior of said body and having separate conductors connected to each of said pair of electrical contacts and said ground contact, so that when said contacts are inserted into one of the receptacles said multi-conductor cable extends parallel to the face of the multi-receptacle outlet box in a manner to avoid overlying any of the other receptacles in the rectangular receptacle array.

3,975,076

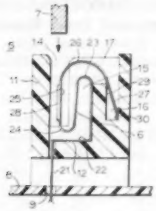
RECEPTACLE FOR PRINTED CIRCUIT BOARD

Sankichi Shida, Nara; Koji Hashimoto; Hyogo Hirohata, both of Neyagawa, and Katsuhiko Honjo, Katamo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 4, 1973, Ser. No. 403,445
Claims priority, application Japan, Dec. 6, 1972, 47-122763
Int. Cl.² H05K *1/07*; H01R *13/64*
U.S. Cl. 339—17 L **12 Claims**

3. A connector for a flat terminal of a circuit panel and a printed circuit board having solder dipping holes therein, said connector comprising a holder having a slot therein for receiving said flat terminal, a horizontal bottom and a plurality of cavities therein separated by partition walls for housing contact means contacted by said flat terminal, said contact means having a plurality of terminals extending out of said

bottom for solder dipping through the solder dipping holes in the printed circuit board on which said connector is to be mounted, and said holder having three legs thereon, one at each end and one at the center of said bottom, respectively, said legs extending vertically to the longitudinal direction of said holder and having the same height as each other and said holder also having two recesses, one at nearly the center between said center leg portion and one end leg portion, and the other at nearly the center between said center leg portion and the other end leg portion, respectively, each recess being a pair of grooves in the opposite outer side walls of said holder at the position of the partition walls for separating adjacent contact means, said grooves being tapered to increase in depth



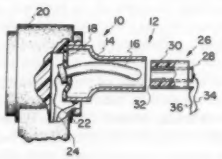
toward said bottom, and said connector further comprising two rectangular-type fixing legs of an elastic material, each fixing leg having two depending leg portions straddling said holder, said depending leg portions having fixing means with an arrow-head shaped on the lower end thereof, said printed circuit board having thereon two pair of fixing holes for receiving only said fixed means on said printed circuit board and being at positions aligned with the bottom ends of said tapered grooves, whereby when said depending leg portions are urged into said grooves so as to fit through the fixing holes in said printed circuit board, said fixing means spring outwardly once through said fixing holes for mounting said connected to said printed circuit board.

3,975,077

ELECTRICAL CONNECTOR

Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 12, 1975, Ser. No. 576,638
Int. Cl.² H01R *13/06*
U.S. Cl. 339—177 R **1 Claim**



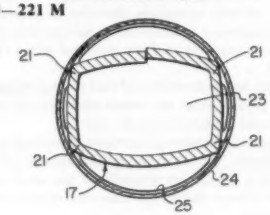
1. An electrical conductor comprised of a socket having spaced apart inner and outer electrically conductive sleeves separated from one another by an insulator, a cup-shaped plug having an insulator base, an electrically conductive center pin mounted on and extending away from said base and a conductive sleeve connected at one end to said base and positioned about and in spaced relationship to said pin, and an outer portion of said center pin being bent in a direction toward and in spaced relation to the side wall of said last-mentioned sleeve, and the bent center pin being tilted toward its unbent position causing a crimping of said insulator base and thereby placing the bent center pin in a position aligned for engagement with said inner sleeve of said socket and to provide a good reliable electrical connection with said inner sleeve when said inner sleeve is brought into engagement with said bent portion of said pin.

3,975,078

FOLDED ELECTRICAL CONTACT

John Preston Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas, Tex.

Filed Apr. 15, 1974, Ser. No. 460,932
Int. Cl.² H01R *9/08*
U.S. Cl. 339—221 M **11 Claims**



1. An interconnection system for electrical component leads, comprising:

a substrate having a generally circular aperture formed therein;

a conductive plating formed on the internal walls of said aperture;

an elongate metal contact formed from a sheet of conductive material folded into a polysided, planar walled body having an enclosed axially extending passageway generally open at both ends and including,

a polysided socket portion of substantially closed perimeter open at the top for receiving, mechanically securing, and conductively engaging a lead of an electrical component inserted therein; and

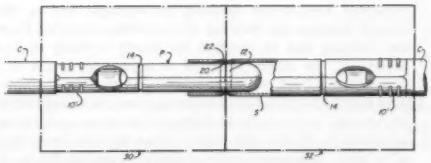
a polysided central portion of substantially closed perimeter integral with and axially extending from said socket portion forming axially extending angular edges of substantially greater curvature than said aperture and being press fitted into said aperture for deforming engagement with the plated material on the walls thereof to hold said contact rigidly in position in said aperture and effect a reliable electrical and mechanical contact therebetween.

3,975,079

PIN AND SOCKET TERMINAL CONNECTOR USING CLAD MATERIAL

Roland Francis Blakesley, Novelty, and Daniel Lincoln Dunn, Aurora, both of Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,121
Int. Cl.² H01R *13/02*
U.S. Cl. 339—278 C **5 Claims**



1. An electrical connector comprising an insulated housing having first and second separable sections and at least one passageway extending therethrough, a pin terminal and a socket terminal respectively disposed in said first and second sections, each of said terminals having means at one end

thereof for securing a conductor thereto, the body of said pin terminal having substantially the same outside diameter therealong and having a clad metal portion along an outer circumference thereof which is spaced a given distance from the tip of said pin terminal, the body of said socket terminal having substantially the same inside diameter therealong except at a clad metal portion which is spaced a given distance from the tip of said socket terminal, wherein the inside diameter of said clad portion of said socket is significantly less than the outside diameter of said clad portion of said pin terminal prior to engagement of said terminals, thereby to provide increased frictional engagement between said clad portion of said socket and said clad portion of said pin terminal when said terminals are engaged,

wherein the inside diameter of said socket terminal is significantly greater than the inside diameter of said clad portion of said socket terminal, and

wherein said clad material portions comprise an inlaid band and wherein the outside circumference of said socket terminal is deformed inwardly in the area of said inlaid band to reduce the inside diameter of said inlaid band of said socket.

3,975,080

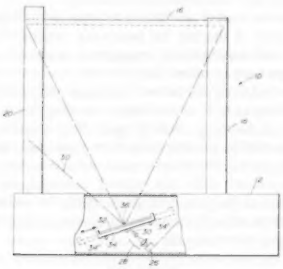
PORTABLE HOLOGRAPHIC INFORMATION RETRIEVAL SYSTEM WITH AN ACTIVE SCREEN

Scott L. Norman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 27, 1975, Ser. No. 562,720

Int. Cl.² G03H *1/30, 1/22*

U.S. Cl. 350—3.5 **5 Claims**



1. An individual-oriented portable book-like holographic viewer for the display of textual information comprising:

a generally enclosed housing having a size approximating a conventional textual volume,

a rear-illuminated active viewing screen;

a collapsible viewing screen carrier affixed to the housing and the rear-illuminated viewing screen, the carrier defining two relative positions for the viewing screen and the housing in the first such position the viewing screen being collapsed toward the housing for storage, and in the second position the viewing screen being extended from the housing and in position for ready viewing by the individual, the viewer being of an approximate size of a conventional book when the screen is in the first position;

a permanent transparency containing a matrix of individual holograms, each such individual hologram containing substantially all the information from an individual page of a book, holograms of successive pages of the book being arranged in a sequential manner in the matrix of holograms, the transparency being disposed in and attached to the housing at an optical distance from the rear of the viewing screen when the viewing screen is in the second position such that a real image of the page is formed on the rear of the viewing screen, the individual holograms having been formed by intersecting a reference beam and a data beam at the transparency,

a source of generally collimated beam of light being affixed within the housing so that at an individual hologram the generally collimated beam of light is conjugate to the reference beam used to form the individual hologram, a real image of the page being formed on the rear of the viewing screen whereby the individual may read the page by looking at the viewing screen, and

means for traversing the transparency relative to the generally collimated beam of light so that a selected individual hologram may be reconstructed.

3,975,081

SIGNAL RECORDING SYSTEM

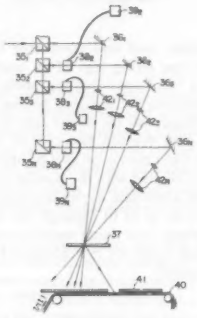
Makota Kato, Nagokakyo; Kosey Kamisaka, Hirakata, and Yoshihiro Okino, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 402,821, Oct. 2, 1973, abandoned. This application May 9, 1975, Ser. No. 576,205

Claims priority, application Japan, Oct. 4, 1972, 47-100019; Oct. 11, 1972, 47-102115; Oct. 13, 1972, 47-102920

Int. Cl.² G03H *1/26*

U.S. Cl. 350—3.5 **2 Claims**



1. A signal recording apparatus, comprising:

means for generating a coherent light beam;

means for splitting said coherent light beam into primary and secondary beams;

means for modulating said secondary beam with a time varying signal;

holographic slit means located at a position where said primary and second beams intersect, said holographic slit means comprising a recording medium having a plurality of slit images recorded thereon, said slit images being made by recording a plurality of pairs of interfering light beams onto said recording medium, one light beam of each pair of interfering beams directly illuminatng said recording medium, said direct illuminating beams having different angles of incidence at said recording medium relative to each other, a second light beam of each pair of interfering beams being projected through a mechanical slit onto said recording medium as a diffraction pattern of said mechanical slit, each of said second beams having different angles of incidence relative to each other at said slit with respect to the longitudinal direction of said mechanical slit;

means projecting said primary beam through said holographic slit means and onto a moving recording medium as a reference beam; and

means for projecting the modulated secondary beam through said holographic slit means and onto said moving recording medium;

said primary and secondary beams having respective angles of incidence at said holographic slit means substantially

the same as the angles of incidence of a pair of beams at said recording medium on which said holographic slit means has been recorded; and

wherein a slit image reproduced from said holographic slit means by said reference beam and a slit image reproduced from said holographic slit means by said modulated secondary beam interference with each other to form an interference pattern recorded on said moving recording medium.

3,975,082
LASER BEAM COUPLING ARRANGEMENT

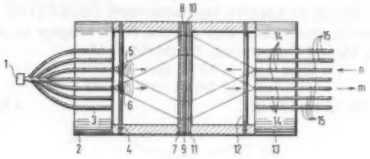
Gerhard Winzer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 23, 1975, Ser. No. 598,283

Claims priority, application Germany, Sept. 9, 1974, 2443128

Int. Cl.² G02B 5/16

U.S. Cl. 350—96 C **7 Claims**



7. A laser beam coupling arrangement for wide-band optical data switching systems, comprising:

a plurality of first optical waveguides which are to be selectively coupled;

a plurality of second optical waveguides spaced from and aligned with respective ones of said first wave guides;

a source of coherent light connected to each of said second waveguides;

an electronically controllable optical mask operable to define a pair of light paths adjacent the ends of said second waveguides; and

a recording hologram structure for semi-permanent hologram recording disposed between said optical mask and said first waveguides and responsive to the light traversing the paths defined by said optical masks to record information identifying a pair of first waveguides which correspond in position to the second waveguides which have ends adjacent the selected channels of said optical mask so that light emerging from one of the selected first waveguides is diffracted by the hologram so that a wave corresponding to the second waveguide which is aligned with the other selected first waveguide is reconstructed and accurately focused into the other selected waveguide.

3,975,083
WIDE ANGLE RETROREFLECTOR ASSEMBLY AND METHOD OF MAKING SAME

William P. Rowland, Southington, Conn., assignor to Reflexite Corporation, New Britain, Conn.

Filed July 24, 1974, Ser. No. 491,356

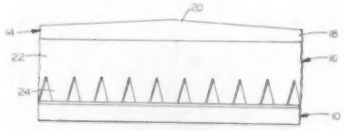
Int. Cl.² G02B 5/12

U.S. Cl. 350—103 **14 Claims**

1. An elongated retroreflective strip comprising:

a. an elongated base of sheet material having closely spaced retroreflective formations in its upper surface portion;

b. an elongated top member of sheet material having closed spaced prism formations on the lower surface thereof of a size providing a center-to-center spacing of about 0.01–0.3 inch and providing a center-to-center spacing at least a factor of 3 relative to the center-to-center spacing of said retroreflective formations of said base, said prism formations being of inverted generally triangular configuration and extending transversely of the longitudinal axis of said top member, said prism formations having their bases lying in substantially a common plane, said top member having a multiplicity of light directing formations spaced along the length of the top surface thereof directing light rays impinging thereon at an angle of less than 10° to the longitudinal plane of said strip downwardly into said prism formations thereof and said prism formations directing light rays into said retroreflective formations, said light directing formations having a center-to-center



spacing of ¼ inch to 3 inches and comprising ribs extending transversely of the longitudinal axis of said top member, said base and top members being fabricated from elongated strips of synthetic resin sheet material sealed together at least along their side margins, said retroreflective formations of said base retroreflecting the light rays directed thereinto back into said prism formations, said prism formations of said top member and said light directing formations then redirecting retroreflected light rays in the direction from which originally received.

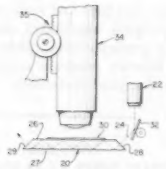
3,975,084
PARTICLE DETECTING SYSTEM

Myron J. Block, Nahant, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 401,207, Sept. 27, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,382

Int. Cl.² G01N 21/00; G02B 21/06

U.S. Cl. 356—103 **22 Claims**



1. Apparatus for detecting submicron dimensional particles in a fluid medium, said apparatus comprising, in combination:

a totally internally reflecting cell bounded at least in part by an interface with said medium; and

imaging optical means including means for focussing said optical means so that the first conjugate plane thereof is substantially coincident with the region of said medium traversed by an evanescent wave formed upon internal reflection of an exciting beam of radiation within said cell.

3,975,085
LIQUID CRYSTAL DISPLAY DEVICE WITH INTERDIGITAL ELECTRODES

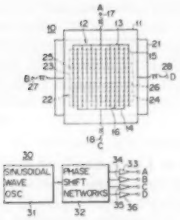
Tatsuya Yamada; Toshihide Kawashima, and Takashi Oozeki, all of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 31, 1974, Ser. No. 519,652

Claims priority, application Japan, Oct. 31, 1973, 48-122383

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **10 Claims**



1. A liquid crystal display device comprising first and second substrates, a first interdigital electrode disposed on said first substrate and consisting of first and second electrodes having a plurality of electrode fingers, the electrode fingers of said first and second electrodes being arranged in an interdigital fashion on the same plane; a second interdigital electrode disposed on one of said first and second substrates and consisting of third and fourth electrodes having a plurality of electrode fingers, the electrode fingers of said third and fourth electrodes being arranged in an interdigital fashion on the same plane, and said first and second interdigital electrodes being arranged opposite to each other so that the electrode fingers thereof intersect at a predetermined angle to each other; a liquid crystal material disposed between said first and second substrates; and drive voltage source means for supplying an AC drive voltage between said first and second electrodes of said first interdigital electrode and between said third and fourth electrodes of said second interdigital electrode wherein said AC drive voltage source means is adapted to apply to at least said first and third electrodes of said first and second interdigital electrodes respectively, AC drive voltages having a predetermined phase difference therebetween so as to thereby produce rotating electric fields to influence the liquid crystal molecules.

3,975,086
ELECTROCHROMIC DISPLAY ELEMENT AND PROCESS

Marshall Leibowitz, Englewood, N.J., assignor to Timex Corporation, Waterbury, Conn.

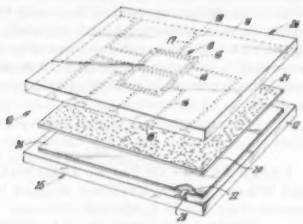
Filed Sept. 19, 1975, Ser. No. 615,013

Int. Cl.² G02F 1/36

U.S. Cl. 350—160 R **4 Claims**

1. In an electrochromic display of the type having first and second parallel spaced substrates, said first substrates having a plurality of transparent front electrodes with a layer of electrochromic material thereon which assumes coloration when supplied with hydrogen, said second substrate having means providing a rear electrode, and an electrolyte hermetically sealed between the first and second substrates, the improvement comprising:

an electroreactive layer associated with said rear electrode means, said layer comprising a surface oxidized coating of electrochromic material containing hydrogen tightly bound in said coating substantially in excess of the



amount needed to impart coloration to the electrochromic material on the front electrodes.

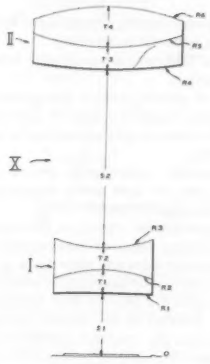
3,975,087
FOUR ELEMENT MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 1, 1975, Ser. No. 601,006

Int. Cl.² G02B 9/04, 21/02

U.S. Cl. 350—175 ML **4 Claims**



1. A two component microscope objective having a predetermined magnification and numerical aperature of substantially 0.10 comprising a double concave negative doublet I and a double convex positive doublet II aligned along an optical axis and has the following parameters

Lens	Radius (R)	Thickness (T)	Spacing (S)	Index of Refraction (ND)	Abbe No. (ν)
			S_1 = 0.24167F		
	R_1 = −4.36334F	T_1 =		ND_1 =	ν_1 =
		0.04651F		1.78446	25.74
I	R_2 = −0.25721F	T_2 =		ND_2 =	ν_2 =
		0.04070F		1.51867	64.45
	R_3 = 0.27059F				
			S_2 = 0.48271F		
	R_4 = 0.96467F				
		T_3 =		ND_3 =	ν_3 =

-continued

Lens	Radius (R)	Thickness (T)	Spacing (S)	Index of Refraction (ND)	Abbe No. (ν)
		0.04070F		1.78446	25.74
II	R_5 = 0.42024F				
		T_4 = 0.07558F		ND_4 = 1.48725	ν_4 = 70.40
	R_6 = 0.39640F				

wherein F is the focal length of the objective in millimeters.

3,975,088

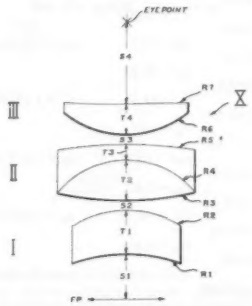
THREE ELEMENT EYEPIECE WITH MAGNIFICATION OF 12X

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 1, 1975, Ser. No. 600,986

Int. Cl.² G02B *3/00, 9/12, 25/00*

U.S. Cl. 350—175 E **2 Claims**



1. A microscope eyepiece having a magnification of about 12X and an apparent field of view of about 51.3° with a maximum exit pupil diameter of substantially 1.25mm and a focal plane F comprising three lens elements aligned along an optical axis extending from the focal plane of said eyepiece to provide a Petzval radius of 1.60F and eye-relief of 0.89F, said lenses having the following values,

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No. (ν)
			S_1= 0.43217F		
	R_1=−1.11836F				
I		T_1= 0.43217F		ND_1= 1.58800	ν_1=61.19
	R_2=−0.09522F				
			S_2= 0.0048F		
	R_3=2.1882F				
		T_2= 0.40816F		ND_2= 1.49776	ν_2=66.90
II	R_4=−0.80743F				
		T_3= 0.14406F		ND_3= 1.78446	ν_3=25.75
	R_5=−2.59983F				
			S_3= 0.0048F		
	R_6=0.94165F				
III		T_4= 0.28811F	ND_4= 1.58800	ν_4=61.19	
	R_7=28.91205F				
			S_4= 0.8835F		

wherein the axial thickness of successive lens elements are T1 to T4, successive axial spaces from the eyepiece focal plane are S1 to S4, successive lens radii are R1 to R7, where the minus sign (−) applies to surfaces whose center of curvature lies on the focal plane side of their vertices, refractive indices and Abbe numbers of the lenses are absolute fixed values ND(1) to ND(4), and ν(1) to ν(4) respectively, and F is the focal length in millimeters.

3,975,089

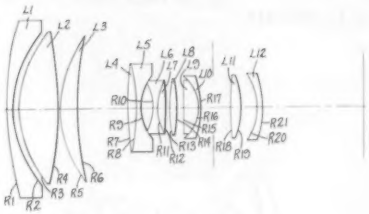
ZOOM LENS

Ellis I. Betensky, Toronto, Canada, assignor to Ponder & Best, Inc., Santa Monica, Calif.

Filed Apr. 19, 1974, Ser. No. 462,366

Int. Cl.² G02B *15/18*

U.S. Cl. 350—184 **19 Claims**



1. A lens having an equivalent focal length variable between predetermined limits, comprising from the object end a first positive group, a second negative group, a third negative group, and a fourth positive group, said first, second and third groups being simultaneously axially movable at different rates with respect to said fourth group to vary the focal length of said lens, all of said lens groups being movable in axially fixed relation to each other to vary the focus of said lens, said lens having a back focal length greater than the equivalent focal length of said lens over a portion of its variable focal length range.

3,975,090

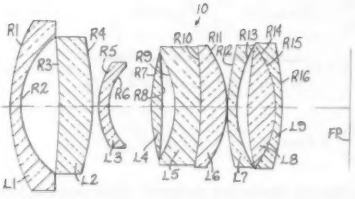
WIDE ANGLE OBJECTIVE

John A. Lawson, Scarborough, Canada, assignor to Optigon Research & Development Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 392,120, Aug. 27, 1973, abandoned. This application July 29, 1974, Ser. No. 492,413

Int. Cl.² G02B *9/64, 7/10*

U.S. Cl. 350—214 **12 Claims**



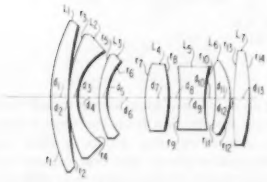
1. A wide angle lens of the retrofocus type comprising a housing, said housing having means for detachable mounting to a camera, a plurality of lens groups in said housing comprising from the object end to the image end, a first negative group, a second negative group in the form of a meniscus having a convex object side surface, a third positive group having a convex object side surface, a fourth positive group having a convex image side surface, a fifth negative group, and a sixth positive group having convex image and object side surfaces, said lens groups arranged in said housing in first and second groupings, said first grouping including said first group and mounted in said housing in fixed relation thereto, said second grouping residing on the image side of said first grouping and being of positive overall power, means for moving said

second grouping with all groups therein in said housing in fixed relation to each other toward said first grouping while said first grouping remains stationary in said housing to focus said lens to within ten equivalent focal lengths of said lens.

3,975,091
WIDE ANGLE PHOTOGRAPHIC LENS

Takahashi, Yasuo, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 570,149
Claims priority, application Japan, Apr. 25, 1974, 49-47031
Int. Cl.[2] G02B 9/00
U.S. Cl. 350—214 **2 Claims**



1. A wide angle photographic lens having a back focal distance of 1.33 times as long as the focal length comprising seven lens components constituted by seven lenses which satisfies the following four conditions:

$$\frac{F}{0.35} < F_1 < \frac{F}{0.2} \tag{1}$$

$$\frac{F}{1.2} < \left| F_{1.2.3} \right| < \frac{F}{0.7} \cdot F_{1.2.3} < 0 \tag{2}$$

$$0.7 < \frac{d_1 + d_2 + d_3 + d_4 + d_5 + d_6}{d_7 + d_8 + d_9 + d_{10} + d_{11} + d_{12} + d_{13}} < 1.2 \tag{3}$$

$$\frac{F}{1.0} < F_{1.2.3.4} < \frac{F}{0.5} \tag{4}$$

wherein the characters designate dimensions as follows:

F: effective focal length of the lens system,

$F_{1.2 \ldots i}$: effective focal length of the lens system comprising the first to the i-th lenses, and

d_k: axial air separations or thicknesses of the k-th air separation or lens thickness,

wherein the first lens is a positive lens the face of which of greater curvature is on the object side, the second and third lenses are negative meniscus lenses convex to the object side, the fourth lens is a positive lens, the fifth lens is a negative lens, the sixth lens is a positive meniscus lens convex to the image side, and the seventh lens is a biconvex lens, and wherein the radii r_1 to r_{14}, the thickness and separation d_1 to d_{13}, the refractive indices n_1 to n_7, and Abbe numbers ν_1 to ν_7 of said first to seventh lenses L_1 to L_7, respectively, satisfy the following conditions:

$F = 100$

$F_1 = 357.1 = \frac{F}{0.28}$ $[f_B = 1.33F]$

$F_{1.2.3} = -96.47 = \frac{F}{-1.036}$

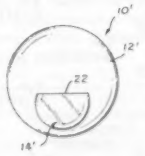
$F_{1.2.3.4} = 132.8 = \frac{F}{0.753}$

Lens	Radius of Curvature r	Lens Thickness or Distance d	Refractive Index n	Abbe No. ν
L_1	$r_1 = 128.85$	$d_1 = 14.46$	$n_1 = 1.69895$	$\nu_1 = 30.1$
	$r_2 = 241.70$	$d_2 = 0.35$		
L_2	$r_3 = 101.75$	$d_3 = 7.12$	$n_2 = 1.64000$	$\nu_2 = 60.2$
	$r_4 = 42.44$	$d_4 = 16.70$		
L_3	$r_5 = 75.03$	$d_5 = 7.12$	$n_3 = 1.51633$	$\nu_3 = 64.1$
	$r_6 = 41.73$	$d_6 = 30.95$		
L_4	$r_7 = 107.63$	$d_7 = 18.91$	$n_4 = 1.73400$	$\nu_4 = 51.5$
	$r_8 = -108.57$	$d_8 = 9.47$		
L_5	$r_9 = -171.54$	$d_9 = 17.15$	$n_5 = 1.80518$	$\nu_5 = 25.4$
	$r_{10} = 118.06$	$d_{10} = 9.62$		
L_6	$r_{11} = -146.41$	$d_{11} = 10.56$	$n_6 = 1.60311$	$\nu_6 = 60.7$
	$r_{12} = -56.83$	$d_{12} = 3.51$		
L_7	r_{13} 393.39	$d_{13} = 12.84$	$n_7 = 1.60311$	$\nu_7 = 60.7$
	$r_{14} = -149.49$			

3,975,092
PHOTOCHROMIC MULTIFOCAL LENSES

Lee O. Upton, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 333,835, Feb. 20, 1973, Pat. No. 3,801,336. This application Nov. 9, 1973, Ser. No. 414,475
Int. Cl.[2] G02C 7/10, 7/06
U.S. Cl. 351—164 **6 Claims**



1. A multifocal lens comprising:

a major piece of low refractive index photochromic glass; and

a segment of relatively high refractive index nonphotochromic glass fused to said major piece wherein said nonphotochromic glass consists essentially of the following ingredients in the range of weight percent:

SiO_2	20.0 – 32.0
B_2O_3	17.9 – 29.9
Al_2O_3	9.6
ZnO	4.8
BaO	2.2
As_2O_3	0.3
PbO	31.5
Sb_2O_5	1.7
TiO_2	0 – 3.0
La_2O_3	0 – 5.0.

3,975,093
PHOTOCHROMIC MULTIFOCAL LENSES

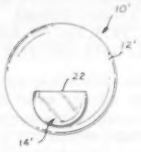
Lee O. Upton, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 414,475, Nov. 9, 1973, Pat. No. 3,915,723, which is a continuation-in-part of Ser. No. 333,835, Feb. 20, 1973, Pat. No. 3,801,336. This application Dec. 23, 1974, Ser. No. 535,646

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.² G02C *7/10, 7/06*

U.S. Cl. 351—164 **9 Claims**



1. A multifocal lens comprising:

a major piece of low refractive index photochromic glass;

a segment of relatively high refractive index nonphotochromic glass fused to said major piece, said non-photochromic glass consisting essentially of the following ingredients in the range of weight percent:

SiO_2	16 – 36
B_2O_3	14 – 33
Al_2O_3	8.5 – 10.5
ZnO	4.2 – 5.4
BaO	1.9 – 2.5
As_2O_3	0.25 – 0.35
PbO	27 – 36
Sb_2O_3	1.4 – 2.0
K_2O	0 – 2
Na_2O	0 – 1
TiO_2	0 – 5
La_2O_3	0 – 6.

3,975,094
APPARATUS FOR COMPOSING COMPOSITE ILLUSTRATIONS

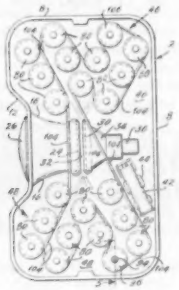
William O. Boggs, 1333 N. Robberson, Springfield, Mo. 65802

Filed Apr. 24, 1975, Ser. No. 571,058

Int. Cl.² G03B *21/26*

U.S. Cl. 353—35 **22 Claims**

1. An apparatus for composing composite illustrations, said apparatus comprising: a case having a viewing aperture therein; means forming a gate within the case, the gate being located such that one side thereof is visible from the viewing aperture; means for causing the other side of the gate to be illuminated; a plurality of first spools located within the case beyond the gate; a plurality of film strips passing through the gate with the film strips being superimposed within the gate, each film strip being wound around a different first spool beyond the gate; first driving wheels in the case, there being a separate first driving wheel associated with each first spool, each first driving wheel being normally disengaged from and rotatable with respect to its first spool, each first driving wheel further being engageable independently of the others with its first spool so that each first driving wheel and its first spool will rotate together; drive means for rotating all of the first driving wheels in unison; and clutch means associated with each first



spool and its first driving wheel for engaging the spools with their respective wheels on a selective basis to rotate a selected first spool and move the film strip thereon through the gate, thus changing the composition of the composite illustration formed in the gate.

3,975,095
CATOPTRIC PROJECTION SYSTEM WITH A SPHERICAL REFLECTING SURFACE

Kazuo Minoura, Yokohama, and Yoichi Hirabayashi, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,711

Claims priority, application Japan, Dec. 27, 1973, 49-3399

Int. Cl.² G03B *21/28;* **G02B** *3/06, 17/08, 5/10*

U.S. Cl. 353—69 **8 Claims**

1. A catoptric system of the type having a spherical reflecting surface, comprising a projection lens element, an anamorphotic element, a spherical mirror and a projection screen,

said projection lens element and said anamorphotic element being arranged on a common optical axis;

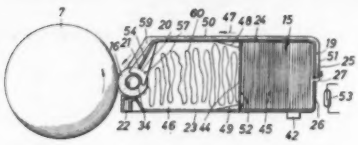
said projection lens being disposed with its optical axis making an angle with respect to the optical axis of said spherical mirror; and

said anamorphotic element having at least one cylindrical refracting surface and being disposed to perform a refractive action in a plane containing the optical axes of said projection lens element and spherical mirror but not in planes perpendicular thereto.

3,975,096
ELECTROPHOTOGRAPHIC COPYING MACHINES

Egon Opravil, Brackel, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany

Filed June 21, 1974, Ser. No. 481,784
Claims priority, application Germany, June 28, 1973, 2332830
Int. Cl.² G03G 21/00
U.S. Cl. 355—15 **14 Claims**



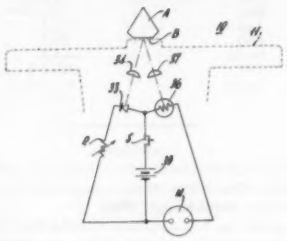
1. An electrophotographic copying machine comprising a continuously rotating transfer element having a photoconductive surface, means adjacent to said surface to charge the transfer element surface electrostatically, means to cause an image of an original to be copied to be exposed to the charged transfer element surface to create a latent image thereon, developer means to develop the latent image, transfer means operative to transfer the developed image to image-receiving material, cleaning means for cleaning the transfer element surface at a location between said transfer means and said charging means, said cleaning means comprising storage means for a cleaning web, a cleaning web within said storage means and a pressure roller in contact with the transfer element surface; said storage means having a first chamber for storing unused cleaning web and a second chamber for storing used cleaning web in a random fashion; guide means associated with said storage means for guiding the cleaning web along a path from said first chamber, around said pressure roller and into said second chamber; first drive means for said transfer element, second drive means for said pressure roller, said first and second drive means being so arranged that the speed of rotation of said transfer element differs from the peripheral speed of said pressure roller, said pressure roller being arranged to entrain the web against the transfer element and in association with said guide means to pass the used web into said second chamber for storage in said random fashion, said pressure roller being the only drive means for removing the unused cleaning web from said first chamber and returning the used cleaning web to said second chamber.

3,975,097
TESTING APPARATUS WHICH MEASURES INDEX OF REFRACTION

Wallace Louis Minto, Sarasota, Fla., assignor to Sarasota Instruments Inc., Sarasota, Fla.

Filed Nov. 20, 1974, Ser. No. 525,540
Int. Cl.² G01N 21/46, 21/48
U.S. Cl. 356—30 **7 Claims**

1. An apparatus for measuring the reflectivity of a surface of a material as an indication of the index of refraction of the material comprising stage means for locating a specimen with a face thereof at a sensing position in a predetermined plane, means including an infra-red light emitting diode for projecting a substantially monochromatic beam of infra-red light in a narrow spectral band onto said specimen face at a predetermined first angle to the normal to said plane, an infra-red light sensitive element exposed to the infra-red light beam reflected by the specimen face and means for measuring a parameter of said infra-red light sensitive element responsive to the amount

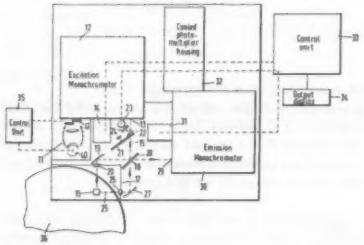


of said infra-red light incident therein as an indication of the index of refraction of said specimen.

3,975,098
SPECTROFLUORIMETER

Michael Anthony West, London, England, assignor to Applied Photophysics Limited, London, England

Filed Aug. 5, 1975, Ser. No. 602,050
Int. Cl.² G01J 3/30, 3/42
U.S. Cl. 356—85 **11 Claims**

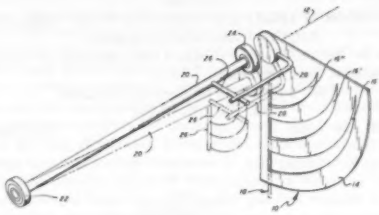


1. A spectrofluorimeter for detecting intensity of luminescence at various wavelengths emitted by a sample under test, which comprises a sample station whereat a sample may be located at a predetermined location, a flash or pulsed source of light, including a plasma discharge lamp, arranged to produce exciting radiation over a continuous range of wavelengths and emit radiation with intermittent intensity peaks at a desired frequency, an excitation monochromator located between the source and the sample station for transmitting radiation at a selected wavelength towards the sample, a first optical system arranged to focus light from the excitation monochromator at the sample station, means located in the radiation path between the excitation monochromator and the sample station to direct a reference beam of radiation to a reference radiation detector and thereby provide a correction signal for fluctuations in light intensity from the source, an emission monochromator arranged to receive luminescence from the sample under test via a second optical system and transmit radiation at a selected wavelength towards a detection system, stepping motors coupled to respective monochromators for varying the wavelength of radiation transmitted by the monochromators, the detection system including a photomultiplier responsive to the radiation transmitted by the emission monochromator and arranged to provide a signal dependent on the intensity of luminescence at the wavelength transmitted by the emission monochromator, and the first and second optical systems being corrected for spherical and chromatic aberrations.

3,975,099
OPTICAL NULL APPARATUS

Leonard Harold Taylor, Loudwater, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed June 16, 1975, Ser. No. 587,098
Int. Cl.² G01N *21/34*; G01J *3/42*; G05D *25/00*
U.S. Cl. 356—89 **13 Claims**



1. In combination with a radiation measuring apparatus of the optical null type including means for divaricating radiation from a source into a reference beam and a sample beam:

a. a mechanical radiation attenuator effective by positional adjustment to control the intensity of said reference beam;

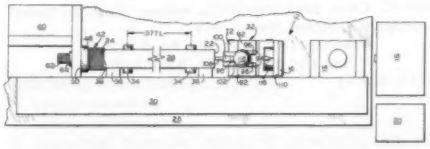
b. drive means for positionally adjusting the attenuator in the reference beam to vary the degree of attenuation thereof in response to differences in intensity between said reference and sample beams; and

c. mechanical corrector means coupled in said drive means for superimposing a generally sinusoidal correcting function on the positioned adjustment of said attenuator and, concomitantly, on the measuring characteristics of the apparatus to reduce any non-linearities of a generally quadratic function that might be present in said characteristic.

3,975,100
METHOD AND APPARATUS FOR IMPROVING THE ACCURACY OF MEASURING THE LENGTH OF A GAGING STANDARD BY LASER INTERFEROMETER MEANS

Benjamin R. Taylor, Waterford, N.Y., assignor to The United States of America, as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,826
Int. Cl.² G01B *9/02*
U.S. Cl. 356—106 R **10 Claims**



1. In a measuring system wherein a laser beam is transmitted through a stationary interferometer to impinge on a horizontally movable target retroreflector for providing a continuous record of the linear displacement thereof relative to the stationary interferometer, means for measuring the distance between the parallel end faces of a length type of gaging standard to an accuracy within one millionth of an inch, comprising,

means for suporting the length standard in coaxial relation with the laser beam,

a carrier having a virtually friction-free slide thereon arranged to fixedly mount the target retroreflector at one end thereof,

a gaging probe projecting from the opposite end of said slide in coaxial alignment with the target retroreflector,

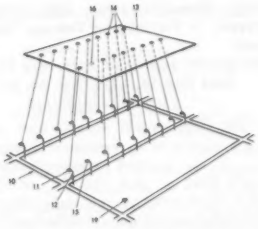
means on said carrier for applying an independent horizontal force to said slide at the conclusion of the slidable movement imparted to said carrier for bringing said probe into gaging contact with one end face of the length standard, and

a swiveled planar surface releasably locked to the other end face of the length standard to duplicate the orientation thereof whereby the pressure between said gaging probe and said planar surface at the termination of the linear displacement of the target retroreflector is identical to the pressure between said probe and said one end face of the length standard at the beginning of the measuring displacement thereof.

3,975,101
METHOD OF DETERMINING OPERATING CONDITION OF CITY STREET LIGHTING UNITS

Robert W. Copeland, 43, Station Road, Keswick, Cumberland, England

Filed June 13, 1974, Ser. No. 478,851
Int. Cl.² G01B *11/00*
U.S. Cl. 356—162 **1 Claim**



1. A surveillance method for a municipal street lighting system for identifying non-functioning street lights within said system comprising the steps of:

a. selecting an area of said municipal street lighting system,

b. making a reference aerial photograph of said selected area while all street lights in the photographed area are operative for recording the locations of the street lights therein while screening out light from other sources so that light from said other sources is not recorded,

c. subsequently making another aerial photograph of said selected area for recording the locations of the street lights therein while screening out light from other sources,

d. superimposing said other photograph and said reference photograph and thereby determining the location of street lights not shown on said other photograph from said reference photograph.

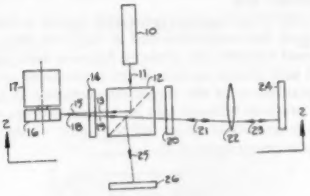
3,975,102
SCANNING PhOTOELECTRIC AUTOCOLLIMATOR

Alvin H. Rosenfeld, Cromwell, and Carl A. Zanoni, Middletown, both of Conn., assignors to Zygo Corporation, Middlefield, Conn.

Continuation-in-part of Ser. No. 492,781, July 29, 1974, Pat. No. 3,885,875. This application Mar. 31, 1975, Ser. No. 563,326
The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.² G01B *11/30*
U.S. Cl. 356—167 **9 Claims**

1. A device for measuring the surface profile of a reflective test article or the light beam deviating properties of a transparent test article which comprises (1) a source of radiant energy

which produces a narrow beam of light (2) means for scanning said beam and passing it through (3) means for collimating said beam to provide a raster scanning beam which moves in a series of laterally spaced lines over the test article (4) means for collecting said raster scanning beam after it has probed the



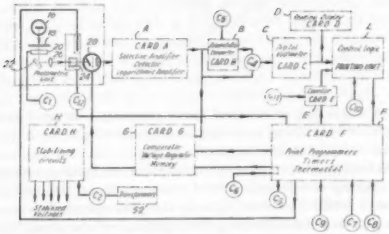
test article to provide an auto-reflected, collected beam (5) means for focusing said autoreflected, collected beam onto a photoelectric position sensor and (6) means for processing the outputs of the position sensor to yield information with respect to the light beam deviating properties of said test article.

3,975,103

PHOTOMETRIC LIQUID ANALYZERS FOR USE IN CLINICAL OR CHEMICAL LABORATORY ANALYSIS

Enzo Sergio Mannucci, Siena, Italy, assignor to Istituto Sieroterapico A Vaccinogeno Toscano "Sciavo" S.p.A., Siena, Italy

Claims priority application Italy, May 17, 1974, 11603
Filed May 14, 1975, Ser. No. 577,786
Int. Cl.² G01J *3/46*
U.S. Cl. 356—184 **7 Claims**



1. A photometric liquid analyzer, comprising:

a photometric unit having

a light source,

a rotary modulator arranged to modulate light from the light source,

at least one interferential filter through which the modulated light is arranged to pass,

a photomultiplier,

an optical system arranged to focus the said light, after passage through the filter, onto the photomultiplier, and

a liquid-sample container unit movable into and out of an analysis position;

the liquid-sample container unit comprising

a container lying in the path of light passing from the optical system to the photomultiplier when the container unit is in the analysis position,

a cycle-start automatic control arranged to initiate analysis of a liquid sample in the container upon the return of the container unit into the analysis position,

a suction-emptying system for removing analysed liquid from the container, and

a thermostatic control system for regulating the temperature of liquid in the container;

electronic circuit means connected to the output of the photomultiplier to receive and process signals fed therefrom caused by light which has passed through the liquid sample in the container; and

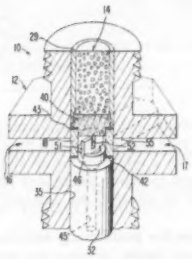
a print-out unit connected to the circuit means to receive the processed signals and to print out analysis readings in dependence thereon.

3,975,104

CONVERGENT LIGHT ILLUMINATED FLOW CELL FOR LIQUID CHROMATOGRAPHY

Miner N. Munk, Walnut Creek, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed July 22, 1974, Ser. No. 490,548
Int. Cl.² G01N *1/10*
U.S. Cl. 356—246 **13 Claims**



1. A flow cell for a detector used in liquid chromatography, said flow cell comprising:

a union connectable at one end to a separation column of a liquid chromatography apparatus, said union having a first flow passage therein for effluent from said column,

entrance and exit windows in said union on diametrically opposite sides of said first flow passage for transmitting light rays through said union and said first flow passage, each window being in the form of a cylindrical segment having the same axial length as the other window, and

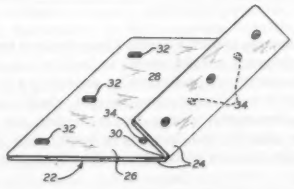
light-obstructing surfaces within said first flow passage and between said entrance and exit windows, said surfaces defining a slit extending axially with respect to said windows, the length of said slit being equal to at least the axial length of said windows, whereby light rays directed only substantially normal to said entrance window can travel to and pass through said exit window.

3,975,105

SHEET LIFTER WITH PUNCHES FOR LOOSELEAF BOOK

Robert C. Cline, Saugerties, N.Y., assignor to F. L. Russell Corporation, Mount Marion, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,714
Int. Cl.² B42F *13/40*; B26F *1/00*
U.S. Cl. 402—1 **7 Claims**



1. A sheet lifter for a looseleaf, ring binder book comprising a stiff elongated panel having a hinge line extending lengthwise thereof and dividing the panel into a main body portion

and a flap portion, the main body portion having elongated openings adjacent the edge opposite the hinge line and being elongated in a direction at right angles to said edge for receiving the rings of a binder, the main body portion and flap portion normally lying in the same plane for functioning as a sheet lifter, and the main body portion being substantially wider than the flap portion in a direction at right angles to the hinge line, the flap portion being movable about the hinge line as an axis and into different angular positions up to substantially 180° with respect to the main body portion and overlying said main body portion, a plurality of openings through the panel and along a line spaced from and parallel to the hinge line, punches connected with the panel along another line spaced from and parallel to the hinge line but on the other side of the hinge line from the line of openings, the line of openings and the line of punches being at the same distance from the hinge line, said elongated openings, said plurality of openings and said punches being in alignment in a direction at right angles to said hinge line so that the punches register with the respective openings when the flap portion is swung substantially 180° into a position overlapping and adjacent to and substantially parallel with the main body portion and holes punched in a sheet will have the same spacing as the elongated openings, the punches fitting snugly into the respective openings for punching holes through a sheet disposed between the openings and the punches, the hinge line of the sheet lifter being stiff enough to hold the main body portion of the panel and the flap portion thereof in substantial alignment when no force is being applied to the flap portion to swing it angularly about the hinge line as an axis.

3,975,106

BUILDERS SCAFFOLDING

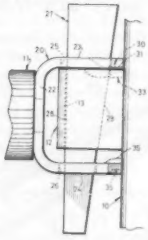
Raymond Ernest Steele, Kenilworth, England, assignor to Kwikform Limited, Birmingham, England

Filed May 8, 1975, Ser. No. 575,675

Claims priority, application United Kingdom, May 8, 1974, 20191/74

Int. Cl.² F16B 7/04

U.S. Cl. 403—374 **5 Claims**



1. In builders scaffolding comprising
a. upright members,
b. cross members, and
c. connecting means for detachably connecting said cross members to said upright members, each such means comprising
d. a soocket mounted on the exterior of said upright member, the socket being open at each of its two opposed ends which are spaced apart along the length of the upright member,
e. a connector member provided at or near one end of said cross member and including two limbs which in the operative position are spaced apart vertically to permit of the upright member socket being received therebetween, each limb having an abutment face adapted to abut against the upright member, each limb further being provided with an opening,
f. a wedge clamping member received in said openings and extending through said socket whereby in connecting the cross member to the upright member the two limbs of the connector means are disposed vertically spaced apart and straddle the socket with the wedge clamping member extending through the two open ends of the socket in pressure engagement with an edge of the opening of each of the two limbs which is nearest to the upright member and also with an internal clamping face of the socket in such a manner that said abutment faces of the two limbs are brought into pressure engagement with the upright member at positions above and below the socket,

the improvement wherein

g. the upper limb of each such connector member is formed with a depression extending fully up to the abutment face of the upper limb and affording at the under side of the upper limb a pair of oppositely directed guide faces each extending transversely to the abutment face of the upper limb, the guide faces being spaced relatively apart by a distance less than the maximum internal width of the socket and extending substantially parallel to the corresponding side of the socket so as to permit of said faces overlapping with the interior face of the socket against which they are located, and
h. the distance between the underside of the depression and the upper face of the lower limb is greater than the vertical depth of the socket so as to enable the depression to be received within the upper end of the socket.

3,975,107

ANCHORAGE STUDS

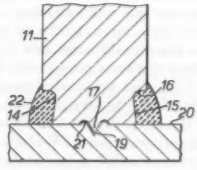
George Molyneux, and George Walter Molyneux, both of Gloucester, England, assignors to Molyneux Engineering Company Limited, Gloucester, England

Division of Ser. No. 225,577, Feb. 11, 1972, Pat. No. 3,891,332. This application Mar. 3, 1975, Ser. No. 554,459

Claims priority, application United Kingdom, Feb. 11, 1971, 4418/71; Sept. 3, 1971, 41160/71

Int. Cl.² F16B 9/00

U.S. Cl. 403—271 **2 Claims**



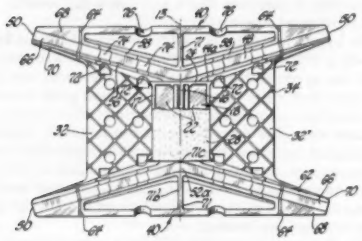
1. A welded stud construction comprising a metal stud and a metal base member, the metals of the stud and base member being similar, there being a peripheral cut-away portion at one end of the stud, a fillet weld in said peripheral cut-away portion that integrates said stud and base member, said cut-away portion being undercut into the side of the stud and defining a terminal end having a single frusto-conical surface whose large diameter end is at the end of the stud adjacent the base member, said cut-away portion being smoothly curved from its smaller end outwardly and away from the base member to the flank of the stud.

3,975,108

SNOW PLOWABLE PAVEMENT MARKER

Donald C. Suhr, Farmington Hills, Mich.; John F. Domaracki, and Robin A. Arnott, both of Windsor, Canada, assignors to ITL Industries, Inc., Newark, Ohio

Filed June 9, 1975, Ser. No. 585,002
Int. Cl.² E01F 9/04
U.S. Cl. 404—16 26 Claims



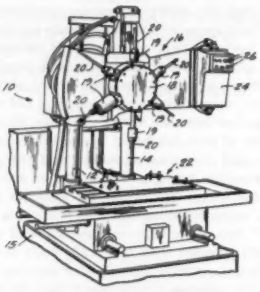
26. A snow plowable pavement marker comprising: a body having a fore and aft axis that extends parallel to the direction of travel when the body is secured to the surface of a roadway and a transverse axis extending perpendicularly with respace to said fore and aft axis; means defining a base plane for said body; said body having a top wall spaced from said base plane, a pair of outer walls extending in opposite directions from said top wall to said base plane with said fore and aft axis intersecting said outer walls, and a pair of side walls spaced from each other on opposite sides of said fore and aft axis and depending from said top wall and extending between said pair of outer walls; a pair of snow plow ramp sections each secured to one of said side walls; each of said snow plow ramp sections including a pair of snow plow ramps extending in opposite directions from said transverse axis; each of said snow plow ramps having an enlarged end adjacent said transverse axis and decreasing in cross-section to a tip portion at the distal end thereof spaced from said transverse axis such that snow plows and like implements moving toward said body in a direction from said tip portion will be guided over said body by said snow plow ramps; each of said snow plow ramp sections having an outer side wall extending from the tip portion of one of its snow plow ramps to the tip portion of the other of its snow plow ramps; said outer side wall having a straight lower edge; each of said snow plow ramps having an inner side wall extending from said tip portion toward said transverse axis and diverging from the straight lower edge of said outer side wall in the direction of said transverse axis; each of said snow plow ramp sections having a V-shaped metal reinforcing member with its apex located at said transverse axis and a pair of legs extending outwardly with respect to said body from said apex portion to said distal ends of said snow plow amps to define reinforcing ribs for said respective snow plow ramps to define reinforcing ribs for said respective snow plow ramps, said reinforcing ribs being received between the inner walls of said respective snow plow ramps and said outer wall of said ramp section; a top wall portion extending from the upper edge of each of said inner side wall to the respective leg of said reinforcing member; a top wall portion extending from the upper edge of said outer side wall to the reinforcing rib of each of said snow plow ramps; a web portion depending from each of said top wall portions on opposite sides of each of said reinforcing ribs; at least one hole in each of said reinforcing ribs; and a connector extending through each of said holes with its opposite end joined to the webs on opposite sides of said reinforcing rib to interlock said reinforcing rib with said webs; said ramp section being entirely of plastic material except for said V-shaped reinforcing member.

3,975,109

Z-AXIS DRIVE ASSEMBLY

James L. Frazierr, Los Alamitos, Calif., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,899
Int. Cl.² B23B 34/20
U.S. Cl. 408—35 13 Claims



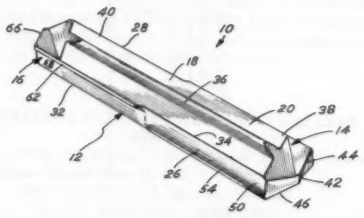
1. In a machine tool having spindle support means for supporting a spindle, and guide means adapted to guide movement of said support means in a direction parallel to the axis of said spindle; a variable speed drive for driving said support means relative to said guide, comprising, in combination, a rack secured to said support means, a pinion in engagement with said rack, a harmonic drive unit supported in fixed relation relative to said guide for driving said pinion, and a variable speed electric motor mounted in fixed relation relative to said harmonic drive unit for driving said harmonic drive and for moving said support means relative to said guide.

3,975,110

FLAT BEADED DOUBLE END TRACK BIT

Gerald G. Kraiss, Brookfield, Ill., assignor to Avildsen Tools and Machines, Inc., Chicago, Ill.

Filed Oct. 6, 1975, Ser. No. 619,838
Int. Cl.² B23C 51/00
U.S. Cl. 408—228 3 Claims



1. An improved flat beaded track bit comprising:
an elongated, generally rectangular member having a first end, a second end and middle section, disposed midway between the first and second ends, and including first and second flat, substantially parallel, side surfaces extending between the first and second ends and curved, upper and lower surfaces extending between the side surfaces and between the first and second ends, with a first longitudinal edge joining the first side surface and the upper surface, a second longitudinal edge joining the second side surface and the upper surface, a third longitudinal edge joining the first side surface and the lower surface and a fourth longitudinal edge joining the second side surface and the lower surface and with each of the first, second, third and fourth longitudinal edges extending, from one end to the other, between the first end to the second end

of the member; a first longitudinal bead formed on the first side surface, disposed midway between the first and third edges and extending between the first and third edges and extending between the first and second ends of the member; a second longitudinal bead formed on the second side surface, disposed midway between the second and fourth edges and extending between the first and second ends of the member, the first and second side surfaces, including the first and second longitudinal beads, constituting the shank portions of the track bit and being adapted to be held by a machine which may then be utilized to rotate the member about its central longitudinal axis; a first drill body formed on the first end of the body and including a centrally disposed first chisel edge and first and second cutting lips, with the first lip extending from the first chisel edge to adjacent to one end of the first longitudinal edge and with the second lip extending from the first chisel edge to adjacent to one end of the fourth longitudinal edge; a first margin formed on the upper surface and along the first longitudinal edge, from its one end to adjacent to the middle section of the member, with the remaining land portion of the upper surface, between the first and second longitudinal edges and between the first end and the middle section of the member, having a reduced diameter body diameter clearance; a second margin formed on the lower surface and along the fourth longitudinal edge, from its one end to the middle section of the member, with the remaining land portion of the lower surface, between the third and fourth longitudinal edges and between the one end and the middle section of the member, having a reduced diameter body diameter clearance; a second drill body formed on the second end of the member and including a centrally disposed second chisel edge and third and fourth cutting lips, with the third lip extending from the second chisel edge to adjacent to the other end of the second longitudinal edge and with the fourth lip extending from the second chisel edge to adjacent to the other end of the fourth longitudinal edge; a third margin formed on the upper surface and along the second longitudinal edge, from its other end to adjacent to the middle section of the member, with the remaining land portion of the upper surface, between the first and second longitudinal edges and between the second end and the middle section of the member, having a reduced diameter body diameter clearance; a fourth margin formed on the lower surface and along the third longitudinal edge, from its other end to adjacent to the middle section of the member, with the remaining land portion of the lower surface, between the third and fourth longitudinal edges and between the other end and the middle section of the member, having a reduced diameter body diameter clearance.

3,975,111

COMBINATION EXTENSION AND COMPRESSION TOOL HOLDER

Louis A. Kubicek, 2124 Lake View, Ypsilanti, Mich. 48197

Filed Jan. 27, 1975, Ser. No. 544,126
Int. Cl.² B23B 51/16
U.S. Cl. 408—239 R **3 Claims**

1. The combination of a tool holder and a deburring tool, comprising:

a housing having a recess formed therein;

a tool holding rod having an enlarged portion slidably mounted in said recess and an elongated reduced portion extending outwardly from said recess;

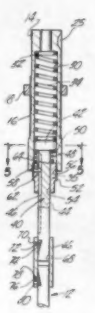
a first resilient means disposed in said recess and biasing said enlarged portion of said rod axially outwardly from said recess;

a cap for closing said recess, said cap having an aperture for receiving the reduced portion of said rod therethrough;

a second resilient means disposed between said cap and said enlarged portion of said rod for biasing said rod axially inwardly into said recess;

means to prevent rotation of said rod relative to said housing while permitting axial movement of said rod relative to said housing;

means for attaching the deburring tool to said reduced portion of said tool holding rod, whereby said first resilient means permits said deburring tool to retract relative to said housing and said second resilient means permits said deburring tool to outwardly extend relative to said



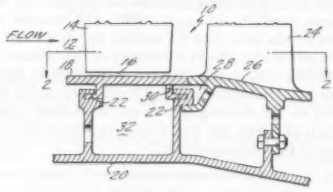
housing and wherein the axial compressive force of said first resilient means is substantially greater than and occupies more space than the axial compressive force of said second resilient means so as to provide space for receiving the tool holding rod within the recess when an imperfectly formed hole is encountered by said tool.

3,975,112

APPARATUS FOR SEALING A GAS TURBINE FLOW PATH

Henry Bispham Brown, Manchester, and Francis Louis DeTolla, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 9, 1975, Ser. No. 585,283
Int. Cl.² F01D 5/14
U.S. Cl. 415—116 **3 Claims**



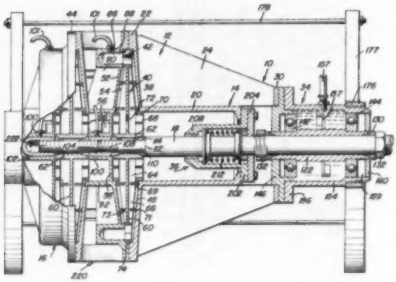
1. In a gas turbine engine of the type having a coolable blade tip shroud comprising a plurality of shroud segments including a gap between each pair of adjacent segments, and having a plurality of vane clusters positioned axially downstream of the shroud including a gap between each pair of adjacent clusters, the shroud segments being rearwardly adjustable with respect to the vane clusters to inhibit the leakage of cooling medium therebetween, wherein the improvement comprises:

a plurality of the shroud segments the number of which is in integral relationship with the number of of vane clusters and wherein the gap between each pair of adjacent vane clusters is in substantial alignment with one of the gaps between adjacent shroud segments.

3,975,113
CENTRIFUGAL PUMP

Ethridge F. Ogles, Rte. No. 4, Ada, Okla. 74820

Filed Dec. 31, 1974, Ser. No. 537,658
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl.² F04D 29/58
U.S. Cl. 415—180 14 Claims



1. A rotary pump comprising a casing having an interior hollow chamber, a rotary impeller disposed in said chamber, a shaft connected with said impeller and extending exteriorly of the casing for rotatably driving the impeller, inlet means in said casing for admitting flowable material to be pumped to the central portion of the impeller, said impeller including vanes thereon for impelling the material as the impeller rotates, outlet means incorporated into the casing and communicating with the portion of the casing receiving the periphery of the impeller for receiving the material impelled by the impeller, said outlet means including inwardly extending passage defining means communicating with an outlet pipe generally coincident to the rotational axis of the impeller, said impeller being in the form of a substantially circular plate, said vanes being disposed radially on each surface of the plate, the central portion of the plate including aperture forming means therein enabling flowable material to be impelled by the vanes on both sides of the impeller, said inlet means being in the form of a tubular member having an inlet pipe communicated therewith, said shaft being disposed in said tubular member, seal means interconnecting the shaft and tubular member outwardly of the inlet pipe for sealing the shaft, and bearing means on said casing axially outwardly of the tubular member for supporting said shaft in relation to the casing, lubrication means for said bearing means, and means circulating lubricant in relation to the bearing means and a cooling jacket associated with the inlet for preventing excessive temperatures occurring in the bearing means.

3,975,114
SEAL ARRANGEMENT FOR TURBINE DIAPHRAGMS AND THE LIKE

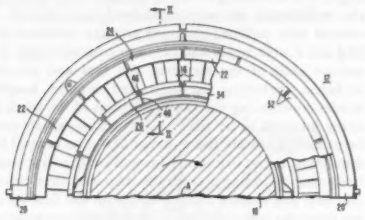
Ralph W. Kalkbrenner, Hempfield Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1975, Ser. No. 615,853
Int. Cl.² F01D 5/20
U.S. Cl. 415—217 5 Claims

1. In a gas turbine, a seal arrangement comprising:

a number of arcuate stator segments disposed in end-to-end relation to form at least a part of an annular array, the opposing ends of adjacent segments including facing grooves adapted to receive seal strips to bridge any gap existing between said ends; and

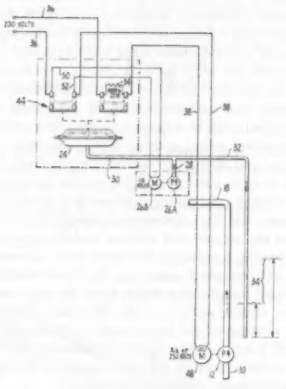
seal strips received in said facing grooves, each of said seal strips comprising at least two bimetal ribbons fastened along their longitudinal centerline portions and arranged with their high expansion sides facing so that the longitudinal edge portions of said ribbons deflect away from each other with increasing temperatures.



3,975,115
PUMP CONTROL SYSTEM

Lewis M. Fisher, Forestville, and Joseph A. Williams, Sebastopol, both of Calif., assignors to Hydrodyne Development Company, Forestville, Calif.

Filed Feb. 7, 1975, Ser. No. 548,087
Int. Cl.² F04B 49/04
U.S. Cl. 417—38 4 Claims



1. For a water well pumping system including a well casing, a water delivery pipe and a water pump having an electric motor; control means to turn the water pump motor on when the level of water within the casing reaches a predetermined high level and to turn the pump motor off when the level reaches a predetermined low level, said control means comprising: an air pump, a low wattage electric motor for the air pump, a two-pole, normally open switch, a voltage source, leads connecting the source with the water pump motor through the switch when the switch is in closed condition, leads connecting the source with the air pump motor through the switch when the switch is in open condition, means including a pressure-responsive diaphragm control unit to open and close the switch, and air tube connections between the well and air pump and between the air pump and diaphragm control unit, whereby when the air pressure within the diaphragm control unit reaches a predetermined upper value the air pump motor is de-energized and the water pump motor is energized upon closure of said switch and when the air pressure within the diaphragm control unit reaches a predetermined lower value the air pump motor is energized and the

water pump motor is de-energized upon the opening of said switch.

3,975,116

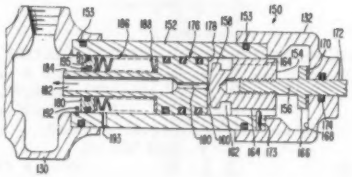
PRESSURE RESPONSIVE FLUID VALVE ASSEMBLY

Eugene P. Feild, Santa Rosa, and Donald C. Bergstedt, Petaluma, both of Calif., assignors to FNB Products, Inc., Menlo Park, Calif.

Division of Ser. No. 302,382, Oct. 30, 1972, Pat. No. 3,856,043. This application Sept. 11, 1974, Ser. No. 504,942

Int. Cl.² F04B *49/00*

U.S. Cl. 417—311 **3 Claims**



1. A fluid pump comprising: a fluid inlet manifold, a fluid outlet manifold spaced from the inlet manifold; a number of fluid piston and cylinder assemblies spanning the distance between said manifolds and operable to sequentially pump fluid from the inlet manifold to the outlet manifold when the pistons of said assemblies are reciprocated in respective cylinders thereof; means coupled with the pistons of said assemblies for sequentially reciprocating the same; a fluid pressure regulator, said regulator including a barrel; means on said manifolds for mounting the barrel thereon in spanning relationship thereto and in fluid communication therewith; a fluid valve within the barrel and including a pair of valve members, one of which is movable; means biasing the valve members toward each other, each valve member having a working face, the working faces of the valve members being in face-to-face relationship, the working face of at least one of said valve members having a tapered configuration to define there between a transversely wedge-shaped annular space having a maximum separation at the outer periphery in the range of 0.0001 inch to 0.01 inch, when the valve members are closed, one of the valve members having an orifice extending thereinto from the working face thereof, said working faces being engageable with each other to block said orifice and thereby close said valve,; means placing the orifice in fluid communication with the inlet manifold; and means placing the outlet manifold in fluid communication with a region adjacent to the outer peripheries of said working faces, each working face having an effective length from its outer periphery to its center of at least 1.5 times the radius of the orifice.

3,975,117

PUMP AND MOTOR UNIT WITH INDUCER AT ONE END AND CENTRIFUGAL IMPELLER AT OPPOSITE END OF THE MOTOR

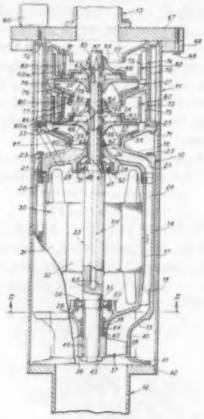
James Coolidge Carter, 1735 San Pasqual St., Pasadena, Calif. 91106

Filed Sept. 27, 1974, Ser. No. 509,853

Int. Cl.² F04B *17/00, 15/08*

U.S. Cl. 417—370 **11 Claims**

1. A pump and motor unit with an inlet at one end and an outlet at the opposite end which comprises an axial flow inducer impeller in said inlet of the unit, a centrifugal impeller in said unit adjacent said outlet, a motor between said axial flow inducer and said centrifugal impeller, said centrifugal impeller having an inlet side facing the inducer impeller and receiving fluid directly from the inducer impeller for discharge to said outlet, a motor shaft extending beyond both ends of the motor of said unit supporting said inducer impeller at one end and supporting the centrifugal impeller at the opposite end, said centrifugal impeller exerting an axial thrust load on said motor shaft opposing the axial thrust load of the inducer impeller,



and means in said unit providing a direct continuous substantially axial flow path from the inducer impeller to the centrifugal impeller.

3,975,118

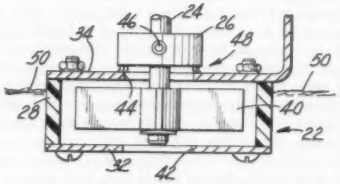
NON-CONTACTING SHAFT SEAL

Carl E. Anderson, Des Plaines, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 3, 1974, Ser. No. 475,761

Int. Cl.² F04B *17/00*

U.S. Cl. 417—424 **2 Claims**



1. A pump for pumping liquids comprising:

a rotatable impeller immersible into the liquid to be pumped;

a stationary submersible housing surrounding said impeller, said housing having an inlet port, an outlet port and a first wall disposed above said impeller, said first wall having an aperture defined therein above said impeller;

an impeller drive shaft engaging said impeller and extending upwardly through said aperture, said drive shaft having a diameter substantially smaller than the diameter of said aperture and positioned within said aperture to define a substantial, uninterrupted, annular space around the entire periphery of said drive shaft between said drive shaft and the edges of the wall defining said aperture, said annular space being sufficiently large to permit free flow of the pumped liquid and air therethrough;

means for generating an annular area of turbulence around the periphery of said aperture, said turbulence generating means including a collar affixed to said drive shaft in spaced relationship with said first wall, said collar having a radially extending surface uninterruptedly spaced in an opposing, substantially parallel relationship approxi-

mately 0.005 to 0.050 inches from said first wall, said collar being larger than said aperture and positioned completely to overlap the entire periphery of said aperture by at least 0.0625 inch, said collar being rotatable by said drive shaft upon the rotation of said impeller for generating the annular area of turbulence around the entire periphery of said aperture in the area between said wall and said surface for impeding the flow of air into and the flow of liquid out of said housing through the annular space between said drive shaft and said wall when the level of the liquid being pumped falls below the level of said aperture; and

a motor disposed above said impeller and engaging said drive shaft for rotating said drive shaft and said collar.

3,975,119

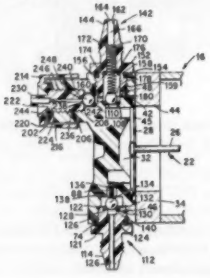
DIAPHRAGM PUMP HAVING AUXILIARY CHAMBER

Clyde A. Farris Jr., 86 Lovell Road, Knoxville, Tenn. 37919

Filed Sept. 17, 1975, Ser. No. 614,316

Int. Cl.² F04B *39/00*

U.S. Cl. 417—434 **7 Claims**



1. In a diaphragm pump including a pump cavity, a distenable diaphragm spanning said cavity, means for distending said diaphragm in forward and backward strokes, inlet and outlet check valves controlling the flow of a liquid through said pump in response to reciprocable distension of said diaphragm, the improvement comprising an outlet chamber located immediately adjacent said outlet check valve, an auxiliary chamber in fluid communication with said outlet chamber and having a wall means and defining a void volume, flange cap means threadably engaging said wall means, conduit means mounted concentrically in said cap means and defining a flow path for the flow of liquid from said auxiliary chamber and, valve means disposed within said auxiliary chamber, said valve means comprising a resilient annular valve seat means and a valve member disposed between the inboard end of said conduit means and said valve seat means whereby the position of said valve member with respect to said valve seat means is selectable by selection of the threaded position of said flange cap means with respect to said wall means of said auxiliary chamber.

3,975,120

WAFER ELEMENTS FOR PROGRESSING CAVITY STATORS

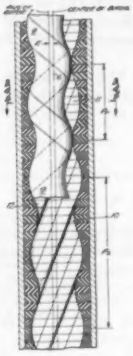
John E. Tschirky, Long Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 415,754, Nov. 14, 1973, and a continuation-in-part of Ser. No. 433,540, Jan. 15, 1974, Pat. No. 3,912,426, and a continuation-in-part of Ser. No. 525,400, Nov. 20, 1974. This application Nov. 21, 1974, Ser. No. 525,828

Int. Cl.² F04C *1/06, 5/00*

U.S. Cl. 418—48 **24 Claims**

1. A stator for a helicoidal progressing cavity transducer comprising a plurality of wafers, each having an internal wall of the same geometric form arranged one after the other in array, each having a polyfoil opening of the same geometry and the same height and the same minor and major axis, the



axis of each wafer angularly displaced counterclockwise from the like axis of adjacent wafers in the array of wafers, by an angle a in degrees which is given by the formula:

$$a = \frac{360^\circ h}{P_s}$$

Where h is the thickness of the wafer, (P_s) is the length of one pitch of the stator, and means to securely fasten said wafers to each other in said array.

3,975,121

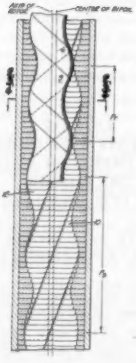
WAFER ELEMENTS FOR PROGRESSING CAVITY STATORS

John E. Tschirky, Long Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. Nos. 415,754, Nov. 14, 1973, abandoned, and Ser. No. 433,540, Jan. 15, 1974, Pat. No. 3,912,426. This application Nov. 20, 1974, Ser. No. 525,400

Int. Cl.² F04C *1/06, 5/00*

U.S. Cl. 418—48 **19 Claims**



1. A stator for a helicoidal progressing cavity transducer comprising a plurality of wafers, each having an internal wall

substantially perpendicular to the wafer surface and arranged one after the other in array, each having a bifoil opening of the same geometry and the same height and the same minor and major axis, the axis of each wafer angularly displaced counterclockwise from the like axis of adjacent wafers in the array of wafers, by an angle a in degrees which is given by the formula:

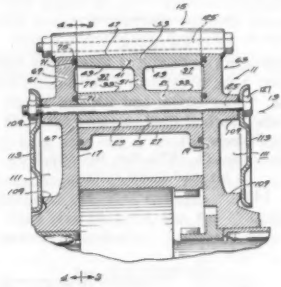
$$a = \frac{360^\circ h}{P_s}$$

where (h) is the thickness of the wafer, (P_s) is the length of one pitch of the stator, and means to securely fasten said wafers to each other in said array.

3,975,122
ROTARY INTERNAL COMBUSTION ENGINE

Eugene R. Hackbarth, Kenosha, Wis., and Harry M. Ward, III, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 20, 1974, Ser. No. 444,044
Int. Cl.² F01C *21/06, 19/12*
U.S. Cl. 418—83 **10 Claims**

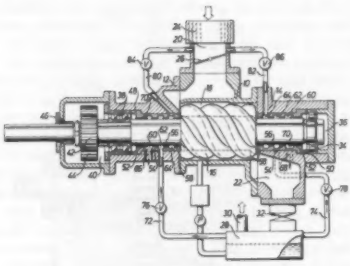


1. A rotary internal combustion engine comprising a unitary housing member including first annularly extending wall means including an outwardly facing surface partially defining a cooling jacket extending generally circumferentially around said first wall means and including ends spaced circumferentially of said cavity, and an inwardly facing surface partially defining a rotor cavity, said housing member also including second wall means extending in outwardly spaced relation from said first wall means and including an inwardly facing surface in opposing relation to said outwardly facing surface of said first wall means to further partially define said cooling jacket, said housing member also including web means extending generally transversely to and joining said first and second wall means, said housing also including opposite end walls to which said first and second wall means extend and further including first and second covers located respectively on said opposite end walls to provide a housing assembly and respectively including first portions further defining said rotor cavity and second portions further defining said cooling jacket, and (wherein) said housing assembly also including (includes) coolant inlet means located in one of said covers adjacent to one circumferential end of said cooling jacket and coolant outlet means located in the other of said covers adjacent to the other circumferential end of said cooling jacket, said coolant inlet means and coolant outlet means communicating with the cooling jacket to provide circumferential coolant flow in said cooling jacket.

3,975,123
SHAFT SEALS FOR A SCREW COMPRESSOR

Lauritz Benedictus Schibbye, Saltsjo-Duvnas, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed Aug. 19, 1974, Ser. No. 498,878
Claims priority, application United Kingdom, Sept. 3, 1973, 41266/73
Int. Cl.² F01C *21/02, 21/04, 19/00, 1/16*
U.S. Cl. 418—97 **19 Claims**



1. In a screw compressor comprising a housing (**10**) defining a working space (**18**) containing a pair of intermeshing male and female screw rotors, the screw rotors being mounted in said housing (**10**) by means of respective rotor shaft means, said housing (**10**) further defining respective bearing chambers which are supplied with lubricant and into which said respective rotor shaft means extend; an inlet channel (**20**); an outlet channel (**22**); and port means in said housing communicating each of said inlet and outlet channels with the working space (**18**) of the housing, the improvement comprising:

at least one shaft seal system associated with at least one of said rotor shaft means, each shaft seal system including:

a pressure gas source means including at least a first pressure gas source (**28**), and means including port means in said working space for communicating said first pressure gas source with the high pressure side of the working space; and

four spaced seal sections (**58,56,54,52**) mounted with a positive clearance relative to an associated rotor shaft means;

an annular intermediate pressure chamber (**64**) being defined between the first (**58**) and second (**56**) seal sections, an annular blocking pressure chamber (**62**) being defined between the second (**56**) and third (**54**) seal sections and being in communication with said first pressure gas source (**28**), and a drain space (**60**) defined between the third (**54**) and the fourth (**52**) seal sections;

said first seal section (**58**) being disposed between the working space (**18**) of the compressor and the intermediate pressure chamber (**64**), the second seal section (**56**) being disposed between the intermediate pressure chamber (**64**) and the blocking pressure chamber (**62**), the third seal section (**54**) being disposed between the blocking pressure chamber (**62**) and the drainage space (**60**), and the fourth seal section (**52**) being disposed between the drainage space (**60**) and the bearing chamber (**36,40**) of the related shaft means; and

means for communicating said first pressure gas source (**28**) with said blocking chamber (**62**);

said drain space draining away any lubricant from the bearing chamber passing over the fourth seal section and any gas passing over the third seal section.

3,975,124

GEAR MOTOR WITH VALVE CONTROLLED PRESSURE BIASED END SEALS FOR FACILITATNG STARTING OF THE GEAR MOTOR

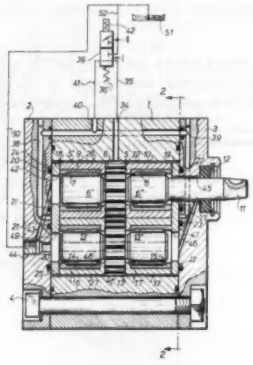
Wilhelm Dworak, Stuttgart, and Karl-Heinz Müller, Gerlingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 26, 1974, Ser. No. 509,738

Claims priority, application Germany, Oct. 1, 1973, 2349304

Int. Cl.² F01C *19/08*; F03C *3/00*

U.S. Cl. 418—132 **11 Claims**



1. A fluid operated gear motor comprising a housing having an interior and a high pressure side and a low pressure side; a pair of meshing gears rotatably mounted in said interior and having first and second axial end faces; first and second sealing means engaging the respective axial end faces; first means for forming first fluid-pressure fields which press said sealing means against said axial end faces; second means forming adjacent at least one of said sealing means a space for development of an auxiliary pressure field separated from said first pressure fields; and a valve selectively movable between a first position connecting said space with a said low pressure side until a predetermined starting pressure of fluid has developed in said motor and for subsequently connecting said space to said high pressure side, said valve comprising spring means for normally biasing said valve to one of said positions and actuating means for moving said valve to the other of said positions.

3,975,125

OIL SEAL ASSEMBLY FOR ROTARY ENGINE

Kunihiko Mizutani; Takami Aoyama, and Kazuhiro Kawamura, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

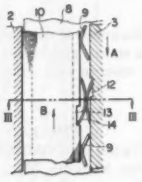
Filed Sept. 11, 1974, Ser. No. 504,896

Claims priority, application Japan, May 2, 1974, 49-49522[U]

Int. Cl.² F04C *27/00*

U.S. Cl. 418—142 **8 Claims**

1. An oil seal assembly for a rotary engine including a rotor having a pair of sides, a housing having said rotor rotably mounted therein, and side walls defined by said housing, closely adjacent said rotor sides and arranged to have said rotor sides move relative thereto upon rotation of said rotor, said assembly comprising, in combination, an annular groove formed in each of said rotor sides, said annular grooves including a bottom wall, an oil seal ring fitted in each of said annular grooves, said oil seal rings including an end wall facing said bottom wall of said annular grooves, spring means engaged between said annular grooves and said oil seal rings for pressing said oil seal rings against said housing side walls during rotation of said rotor, detent means separately provided from said spring means interposed within each of said annular grooves between said oil seal ring and said rotor, said detent means having a pair of oppositely directed bowed members joined together along a mid portion of their lengths in a back-to-back arrangement, first detent engaging means defined on said oil seal ring at said end wall thereof facing said bottom wall of said annular groove, and second detent engaging



means defined on said rotor within said annular groove at said bottom wall thereof, whereby said detent means is adapted to be interposed within said annular groove in such a manner that said detent means is compressed, said first and second detent engaging means being located to be engaged by ends of said pair of oppositely directed bowed members to prevent relative rotation between said oil seal ring and said rotor during rotation of said rotor.

3,975,126

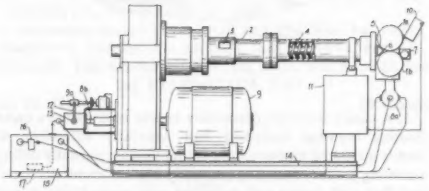
METHOD AND APPARATUS FOR FORMING MATERIAL HAVING A PREDEFINED CROSS-SECTION

Jack Wireman, Yorba Linda, and Richard Elliott Kazares, Fountain Valley, both of Calif., assignors to AMF Incorporated, White Plaines, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,375

Int. Cl.² B28B *17/00*

U.S. Cl. 425—141 **10 Claims**



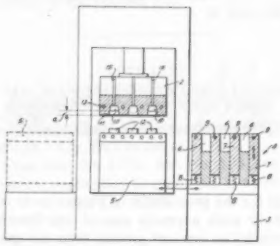
1. An apparatus for extruding an elastomeric material from a source of supply of a predetermined cross-sectional shape including: means for receiving and working material from a source of supply into an extruder means having a material driving means disposed therein, causing said material to be urged to exit out of such extruder means via cooperatively acting nozzle means; a plurality of contra rotating synchronized rollers disposed in proximity to said nozzle means adapted to receive such elastomeric material exiting from said nozzle means; control means being provided with hydraulic pumping means in communication with said plurality of rollers and said extruder; motor means governed by said hydraulic pumping means for advancing said rollers in response to the through-put of said elastomeric material with respect to said extruder means and electro-optical sensing means adapted to sense upon the width of said elastomeric material exiting from said nozzle means in response to a predetermined standard, said electro-optical sensing means being connected to said hydraulic pump means whereby variations in elastomeric material width cause an electrical signal to be generated thereby governing the speed of said hydraulic motor means.

3,975,127

APPARATUS FOR MAKING SHAPED ARTICLES

Edmund Munk, and Herbert Haas, both of Oberstenfeld, Germany, assignors to Furnier-Und Sperrholzwerk J. F. Werz, Jr. KG Werzalit-Pressholzwerk, Oberstenfeld, Germany

Filed Feb. 5, 1975, Ser. No. 547,448
Int. Cl.² B29J 5/08
U.S. Cl. 425—193 12 Claims



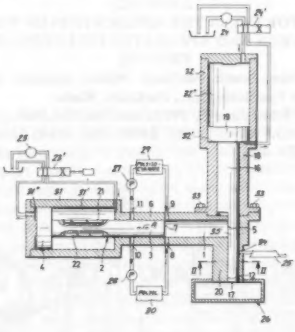
2. A combination as defined in claim 1 wherein said working station comprises a vertically movable upper mold section, said first means comprises a first lower horizontally movably cold-pressing mold section movable beneath said upper mold section and cooperating therewith to form said semi-finished body, and said second means comprises a second lower hot-pressing mold section horizontally movable beneath said upper mold section in place of said first lower mold section and cooperating with said upper mold section to convert the semi-finished body into said shaped article.

3,975,128

SYSTEM FOR FILLING A MOLD WITH REACTIVE SYNTHETIC-RESIN COMPONENTS

Klaus Schlüter, Munich, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed May 28, 1974, Ser. No. 474,021
Claims priority, application Germany, May 29, 1973, 2327269
Int. Cl.² B29G 3/00
U.S. Cl. 425—207 10 Claims



9. An apparatus for charging a mold with a mixture of at least two interreactive components, said apparatus comprising an elongated quieting chamber opening into said mold at a wall of a mold cavity, an elongated mixing chamber extending at right angles to said quieting chamber and opening into the latter at a wall of said quieting chamber, and valve means operatively associated with said mixing chamber for controlling the flow of said components into said mixing chamber, the improvement wherein said apparatus further comprises:

said quieting chamber having a cross-sectional area equal to that of said mixing chamber and a width greater than that of the inlet opening into it from said mixing chamber, a plunger reciprocable in said quieting chamber and of a cross section complementary thereto for completely driving the mixture from said quieting chamber into said mold cavity; and

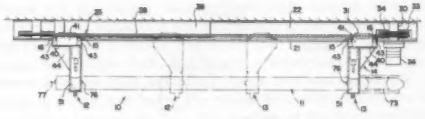
abutment means engageable by said plunger for halting advance thereof with an end face of said plunger flush with said wall of said mold cavity, said valve means including a second plunger reciprocable in said mixing chamber at right angles to the first-mentioned plunger and of a cross section complementary to that of said mixing chamber for completely driving the mixture from said mixing chamber into said quieting chamber; and second abutment means engageable with said second plunger for halting the advance thereof with an end face of said second plunger flush with said wall of said chamber, each of said plungers being provided at an end remote from its end face with a piston, said apparatus further comprising respective cylinders receiving said pistons and means for pressurizing said cylinders to displace said pistons, said end face of said second piston being planar and perpendicular to the direction of displacement thereof, said wall of said quieting chamber being planar and parallel to said end face of said second piston, said first piston being formed with a flat sliding along said wall of said quieting chamber, said mixing chamber being formed with a respective pair of ports assigned to each of said components and longitudinally spaced apart in the direction of reciprocation of said second piston, means for supplying the respective component to the port of each pair proximal to the quieting chamber and for collecting the respective component from the port of each pair distal from the quieting chamber, and said second plunger being provided with respective longitudinally extending passages connecting the ports of each pair in a position of the second plunger in which its end face lies flush with said wall of said quieting chamber.

3,975,129

APPARATUS FOR MAKING FLEXIBLE CORRUGATED TUBING

Vance M. Kramer, Sr., 402 E. Boundry Road, Perrysburg, Ohio 43551

Filed Aug. 16, 1974, Ser. No. 497,843
Int. Cl.² B29D 23/03; B29C 17/04
U.S. Cl. 425—387 B 10 Claims



1. Apparatus for forming lengths of flexible corrugated tubing from sleeves of uncured vulcanizable material comprising

a mandrel adapted to receive a sleeve of uncured vulcanizable material thereover, an elongated, unitary, axially extensible forming member removably positioned over said mandrel and sleeve to define when extended convolutions having continuous inner edges uniformly spaced along said sleeve,

means operatively associated with said mandrel for supplying air under pressure to the interior of said sleeve for radially expanding said sleeve to cause portions thereof to buldge into the spaces between said convolutions,

power means engageable with opposite ends of said forming member of said sleeve for axially collapsing said forming member and said expanded sleeve to compress said

buldges and for thereafter axially extending said forming member and sleeve to radially reduce said bulges,

means associated with said power means whereby said forming member may be removed from said sleeve by movement in an axial direction, and said sleeve may be removed from said mandrel by movement in an axial direction,

said power means also comprising means for supporting said mandrel in said apparatus and permitting removal of said forming member and said sleeve from said mandrel while said mandrel is supported in said apparatus.

3,975,130

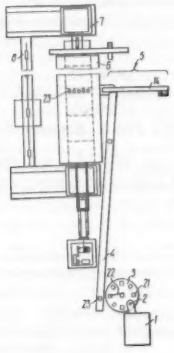
INSTALLATION FOR PRODUCING GLASSCERAMIC TILES

Yakov Aronovich Gitin, Brest-Litovsky prospekt, 17,, kv. 123, Kiev; Konstantin Timofeevich Bondarev, ulitsa Nizhnaya Krymskaya, 33, kv. 171, Moscow; Yakov Borisovich Leschinsky, ulitsa Fedorova, 16, kv. 13, Kiev; Fedor Efimovich Zabkov, ulitsa Stadionnaya, 59, kv. 34; Vasily Gavrilovich Parfimovich, ulitsa Oktyabrskaya, 274, kv. 28, both of Konstantinovka Donetskoi oblasti, all of U.S.S.R.; Asty Sevastyanovich Ruga, deceased, late of Konstantinovka Donetskoi oblasti, U.S.S.R., by Viktor Astievich Ruga, administrator, ulitsa Pushkinskaya, 291, kv. 47, Konstantinovka Donetskoi oblasti, U.S.S.R.

Continuation of Ser. No. 497,264, Aug. 14, 1974, abandoned, which is a continuation of Ser. No. 412,823, Nov. 5, 1973, abandoned, which is a continuation of Ser. No. 239,611, March 30, 1972, abandoned. This application Mar. 20, 1975, Ser. No. 560,113

Int. Cl.² B29C *25/00*

U.S. Cl. 425—404 **2 Claims**



1. An installation for producing glassceramic tiles comprising: a tile shaping unit; a roasting kiln having a movable bottom; a conveyor to transfer tiles from the tile shaping unit to the roasting kiln; a reversible table mounted on a frame, interposed between the conveyor and the roasting kiln to receive the tiles from the conveyor and movable in a transverse direction with respect to the movement of the movable bottom of the roasting kiln so that the table is provided with both a working motion in the direction towards the kiln and a return motion backwards from the kiln to its initial position; a one-way pivoted bar arranged transversely with respect to the table so that during the working motion of the table the bar pivots in the direction of the motion, and during the backward motion of the table the bar assumes a rigid vertical position to push the tiles onto the movable bottom in the kiln.

3,975,131

EXPANSIBLE MOLD FOR THE MANUFACTURE OF PLASTER PIECES

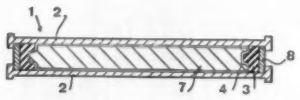
Rene Bergounhon, Palaiseau, France, assignor to Societe Rhone-Progil S.A., Courbevoie, France

Filed Jan. 30, 1975, Ser. No. 545,585

Claims priority, application France, Nov. 29, 1974, 74.39104

Int. Cl.² B29C *3/00*

U.S. Cl. 425—405 H **6 Claims**



1. A mold for the production of plaster parts comprising at least two mold walls normally spaced one from the other in open position by an amount greater than the spaced relation between said walls when defining the mold space, at least two incompressible but deformable components positioned between outer ends of the said walls in sealing engagement therewith, a feed opening communicating with the mold space for the introduction of plaster material to be molded, rigid spacers between outer ends of said walls immediately adjacent the outer ends of the deformable components having a width less than the width of the deformable material and positioned to be engaged by said walls to define the mold space therebetween, a pressure means operative on at least one of said walls for displacement under pressure in the direction towards the other to define the walls of the mold space upon engagement with said spacers whereby the deformable, incompressible components are deformed in the direction towards the said mold walls and expanded in the space between the said mold walls to define the end walls of the mold space therebetween and which, in response to release of pressure return to normal position between said walls by expansion in the direction between the mold walls to displace the mold walls in the direction away from each other to open position while retracting lengthwise between the mold walls to release the article molded in the mold space.

3,975,132

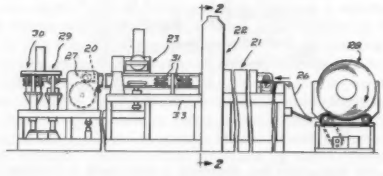
DEVICES FOR USE IN THE APPLICATION OF WORKING PRESSURES AND APPARATUS INCLUDING SUCH DEVICES

Karl H. Keim, South Portland, Maine, assignor to United Industrial Syndicate, Inc., Portland, Maine

Filed June 5, 1975, Ser. No. 584,060

Int. Cl.² B29C *17/00;* **B30B** *1/16, 9/28, 15/14*

U.S. Cl. 425—406 **15 Claims**



1. A device for use in applying pressure on work, said device including at least one first member and one second member and an adjustable connection between them operable to vary the relationship of the second member relative to the work, said connection including first and second rotatable parts, the first part rotatably supported by the first member, both parts including first portions and second portions, said second por-

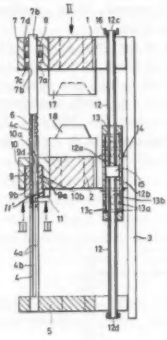
tions being eccentric and of circular section, the eccentric portion of the first part rotatable within the eccentric portion of the second part, and the eccentric portion of the second part rotatably carried by the second member, and adjusting means connected to the first portions and operable to turn said parts equally but oppositely thereby to shift the axes of said eccentric portions towards and away from a plane normal to a predetermined line of force through the axis of said first part without said force becoming torsional relative to the eccentric portion of the second part.

3,975,133

CLOSURE MECHANISM FOR AN INJECTION MOLDING MACHINE OR EXTRUSION PRESS

Thomas Nussbaumer, Zug, Switzerland, assignor to Patent & Inventions Ltd., Zug, Switzerland

Filed Dec. 23, 1974, Ser. No. 535,846
Claims priority, application France, Jan. 4, 1974, 74.00226
Int. Cl.² B29F *1/06*
U.S. Cl. 425—451.2 **3 Claims**



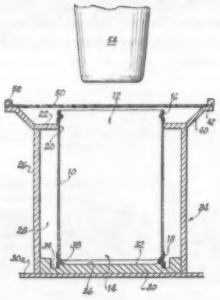
1. A closure mechanism for an injection molding machine or extrusion press, comprising frame means, a number of rods extending essentially in parallelism with one another, a first tool support fixedly connected with said frame means and a second tool support displaceable along said rods, a hydraulic mechanism for displacing the second tool support along said rods, said rods being equipped with engaging means, said second tool support being provided with engaging elements which can be engaged with the engaging means of the rods, said rods being displaceably connected with the first tool support, said hydraulic mechanism comprising at least one displacement device serving to displace the second tool support with respect to the rods and for each rod an additional displacement device fixedly connected with the first tool support and serving to displace each associated rod with respect to the first tool support, each rod possessing a number of lengthwise extending ribs distributed over its periphery, said lengthwise extending ribs being provided with threading forming said engaging means, and each engaging element possesses a threaded bore pierced by one of the rods and provided with lengthwise extending grooves corresponding to the ribs of the rods.

3,975,134

APPARATUS FOR LINING DRUMS WITH PLASTIC MATERIAL

William Repenning, Haddonfield, N.J., assignor to Natico, Inc., Chicago, Ill.

Division of Ser. No. 342,696, March 19, 1973, Pat. No. 3,893,882. This application Oct. 11, 1974, Ser. No. 514,272
Int. Cl.² B28B *21/36*; B29C *27/22*
U.S. Cl. 425—504 **8 Claims**



1. Apparatus for molding a plastic film into a drum shell open at the top with a chime about the upper edge of the shell and open at the bottom to form a liner which remains a part of the drum shell whereby the drum shell functions as its own mold surface during the molding of the liner therein, comprising an outer frame having an opening with a diameter greater than the diameter of the shell and adapted removably to receive the shell therein with the outer frame spaced from the shell to provide an annular space therebetween and a pedestal adjacent the bottom of the frame on which the shell rests as a bottom wall to close the open bottom end of the shell, an annular flange adjacent the upper end portion of the frame and extending inwardly for a distance substantially to engage the outer wall of the shell a short distance below the chime, another annular flange extending outwardly from the upper end portion of the frame and upwardly to a level above the upper edge of the frame, clamping means for said outwardly extending annular flange portion for engaging a plastic film in sealing engagement over the open end of the shell, means associated with the frame for heating a thermoplastic film to the plastic stage, means for drawing a vacuum within the frame for generating vacuum conditions therein when the plastic film is secured in sealing relation to the frame, whereby the plastic film is drawn outwardly into engagement with the inner wall of the shell, and means communicating the space above said inwardly extending flange and said outwardly extending flange and below the sealed film with said means for drawing a vacuum to draw the portion of the film outwardly of the shell downwardly against the outerwall portion portion of the shell above the inwardly extending flange to wrap the film about the open upper end portion of the shell whereby the film lines the inner wall of the shell and is wrapped about the upper edge of the shell and about the chime to form a permanent plastic lined shell.

3,975,135

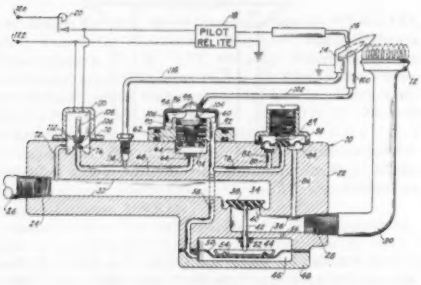
BURNER CONTROL SYSTEM WITH CYCLING PILOT BURNER

Howard R. Kinsella, and Carl F. Fernstrom, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 27, 1974, Ser. No. 527,793
Int. Cl.² F23Q *9/12*
U.S. Cl. 431—43 **4 Claims**

1. In a gas burner control system,

a space thermostat,
an electrical power source,
a source of fuel gas under pressure,
a main burner,
a pilot burner,
a biased closed main valve controlling the flow of gas to said main burner,
an expansible chamber operatively associated with said main valve and operative to open said valve, when gas pressure is applied thereto,
a first biased closed auxiliary valve controlling the flow of gas to said pilot burner and to said expansible chamber,
solenoid means operative when energized to open said first auxiliary valve,



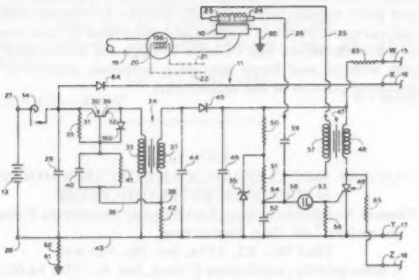
electrically operated ignition means operative when energized to ignite said pilot burner,
a second biased closed auxiliary valve controlling the flow of gas to said expansible chamber, said second auxiliary valve being in series flow relationship with said first auxiliary valve with respect to said fuel gas source and said expansible chamber.
thermostatic means arranged to be heated by pilot burner flame and operative when so heated to open said second auxiliary valve,
means to exhaust said expansible chamber when either said first or said second auxiliary valve closes, and
circuit means under control of said space thermostat connecting said solenoid means and said ignition means across said power source.

3,975,136
BURNER CONTROL SYSTEM

Robert L. Baysinger, St. Louis, and Harry E. Newport, Jr., Crestwood, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed July 28, 1975, Ser. No. 599,898
Int. Cl.² F23N *5/00*
U.S. Cl. 431—74 **11 Claims**

1. In a conrol system for a fuel burner,
a burner;
a source of electrical power;
an electrically operated valve for effecting the flow of fuel to said burner;
spark ignition means connected across said spark power source for producing sparking pulses at a relatively constant frequency;
an integrating capacitor charged in response to said sparking pulses;
circuit means operative in response to each occurrence of a predetermined charge on said capacitor to produce an output pulse comprising a first signal voltage of one polarity and a second signal voltage of opposite polarity;
switching means responsive to said second signal voltage of a first ocurring output pulse to effect opening of said valve and responsive to said first signal voltage of a succeeding output pulse to effect closing of said valve; and

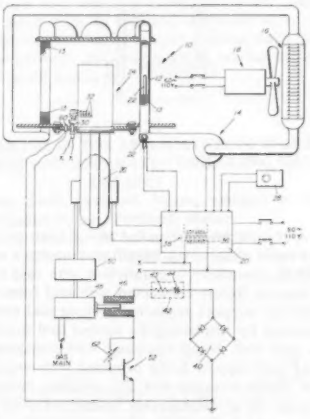


means responsive to burner ignition for terminating operation of said spark ignition means.

3,975,137
BURNER CONTROL SYSTEM

William H. Hapgood, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 49,645, June 25, 1970, abandoned, which is a division of Ser. No. 10,334, Feb. 11, 1970, Pat. No. 3,704,748, which is a continuation-in-part of Ser. No. 737,135, June 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 700,192, Jan. 24, 1968, abandoned. This application Feb. 3, 1975, Ser. No. 546,243
Int. Cl.² F23N *5/08*
U.S. Cl. 431—79 **10 Claims**

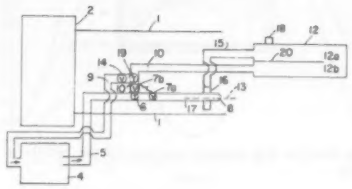


1. A heating system comprising:
a burner positioned in a central plenum defined by an extended surface heat exchanger;
optical sensing means for producing a control signal in response to the presence of a flame; and
variable impedance means responsive to said sensing means for controlling the current through a series connected fuel control valve solenoid, thermal time delay means, and a source of electrical energy.

3,975,138
OIL BURNER

Leslie J. Kinney, 1010 Chillum Road, Chillum, Md. 20782, and Edward M. Knapp, 951 N. Livingston St., Arlington, Va. 22205

Filed Aug. 29, 1974, Ser. No. 501,629
Int. Cl.² F23D 11/44
U.S. Cl. 431—161 4 Claims

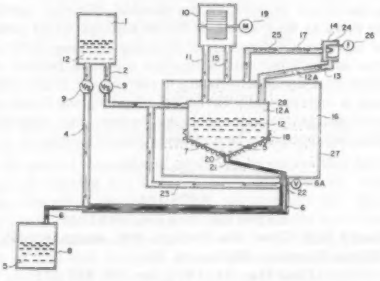


1. In a furnace having an oil burner, an apparatus for the thermal cracking of liquid hydrocarbons into gaseous hydrocarbons and for the delivery of said gaseous hydrocarbons to a gas burner, and for the structure of valves required to control the flow of liquid fuel to the aforesaid thermal cracking, comprising in combination a hollow steel chamber positioned in the zone of combustion created in the furnace by the burning of either oil or gas, said hollow steel chamber being divided by a partial septum configured laterally to divide the hollow steel chamber into upper and lower sub-chambers with gas able to flow from the lower sub-chamber to the upper sub-chamber, the lower sub-chamber being fitted with an inlet for the entrance of liquid fuel and the upper sub-chamber fitted with an outlet for the gas produced in the hollow steel chamber, a thermostatic device being fitted in said hollow steel chamber, the apparatus further comprising a gas delivery tube communicating between said outlet from the upper sub-chamber and a standard gas burner head encircling and adjacent to the liquid burner nozzle of the furnace.

3,975,139
SYSTEM FOR FUEL BURNING

Carmen Santiago Arroyo-Garcia, Nuevo Leon, Monterrey, Mexico

Filed Oct. 29, 1974, Ser. No. 518,605
Int. Cl.² F23D 11/44
U.S. Cl. 431—208 5 Claims



1. An improved fuel burning system characterized by the combination of a fuel tank, a fuel chamber containing both liquid and vaporized fuel, means heating the liquid fuel in said chamber, a burner, at least one pipe transporting liquid fuel from said tank to said chamber, means vaporizing fuel heated in said chamber, means transporting heated vaporized fuel from said chamber to said burner for combustion, means removing residual liquid fuel from said chamber whenever said burner is ignited wherein two pipes transport fuel from said fuel tank to said chamber and means heats fuel in one pipe from the residual liquid fuel flowing from said chamber.

3,975,140
SPACE HEATER

Eugene W. Placek, Middleburg Heights, Ohio, assignor to International Magna Corporation, Cleveland, Ohio

Filed Aug. 28, 1974, Ser. No. 501,241
Int. Cl.² F23D 13/14
U.S. Cl. 431—329 2 Claims

1. An omnidirectional infrared heat generator, comprising:
upper and lower end caps each having outer and inner circular flanges extending axially inwardly, said lower end cap including a central opening and means for connecting the opening to a source of fuel and air;
a fuel-air mixing screen positioned across said opening in said lower end cap;
a mantle comprising a plurality of concentric cylindrical wire grids retained by and extending betweeen the upper and lower inner flanges of the end caps, the outer of said concentric grids having a bonded axially extending seam, the inner grids of said plurality having circumferences of less than 360°, with axially extending gaps defined therein;
an outer cylindrically wrapped grid retained by and extending between said outer flanges of said upper and lower end caps; and
means for retaining said upper and lower end caps about said grids, comprising a plurality of axially extending pins extending from said upper end cap to said lower end cap between said inner and outer flanges, said pins passing through the upper and lower end caps, and means at the ends of said pins for engaging the outer surfaces of said upper and lower end caps.

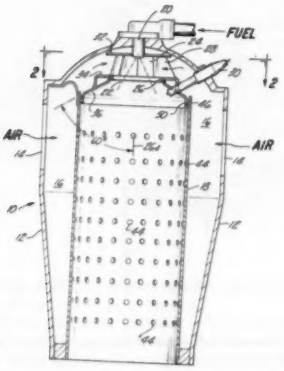
3,975,141
COMBUSTION LINER SWIRLER

Ervin Jack Sweet, Trumbull, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 25, 1974, Ser. No. 482,945
Int. Cl.² F02C 3/24; F23R 1/10
U.S. Cl. 431—352 1 Claim

1. Combustion apparatus for a hot gas turbine, comprising a generally cylindrical combustion tube defining a central axis; spin chamber means coaxial with the combustion tube for supplying a fuel-air mixture thereto; said spin chamber means

comprising first and second end walls extending generally normal to the central axis, and a number of evenly spaced spin vanes extending between said end walls for imparting circumferential swirl to pressurized combustion air flowing into the spin chamber from the annular surrounding space; a fuel spray nozzle arranged on the central axis for spraying liquid fuel through the first end wall into the spin chamber so that the sprayed fuel particles intermix with the pressurized air swirling within the chamber; said spin chamber communicating with the combustion tube by means of a circular throat opening formed in the second end wall of the spin chamber coaxial with the combustion tube; said spin vanes extending substantially tangent to an imaginary circle having a diameter approximately equal to that of the circular throat opening, the leading edge of each vane being located outwardly beyond the circular throat opening so that tangential velocity components are generated in the pressurized air before the air is in axial



registry with the throat opening; each vane being tilted inwardly toward the spin chamber axis at an angle of about 10°, measured from said second end wall to said first end wall, whereby the air adjacent the first end wall has a smaller spin radius as it leaves the vane trailing edges than the air adjacent the second end wall; each vane having a trapezoidal configuration such that the length of each vane from its leading edge to its trailing edge is greater at the second end wall than at the first end wall, whereby the vanes impart greater spin velocity components to the air adjacent the second end wall than to the air adjacent the first end wall; the greater spin velocity components producing a longer residence time of the air near the second end wall compared to the residence time for the air near the first end wall; the different residence times of the different air streams causing those different streams to reach the plane of the throat opening at about the same time, whereby differential flow velocity turbulence is reduced and air throughput is maintained.

3,975,142

HEAT SHIELD COMPOSITION

Donald D. Banks, 812 Peterson St., Fort Collins, Colo. 80521

Filed Nov. 21, 1973, Ser. No. 417,819

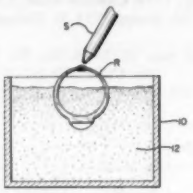
Int. Cl.² F27D *1/16*

U.S. Cl. 432—3 **2 Claims**

1. The method of protecting heat degradable portions of an article from heat applied to the article in its treatment or repair, comprising:

providing a heat shield formed by admixing a major proportion of asbestos powder with an effective minor proportion of boric acid and glycerol with water added to establish a paste-like consistency,

immersing the heat degradable portion of the article to be treated within the heat shield, and



applying heat to the exposed portion of the article to be treated.

3,975,143

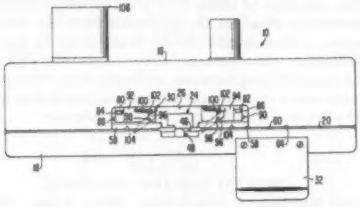
MECHANISM FOR INCREMENTAL MOVEMENT OF VERTICAL FRAME

John C. Diepeveen, 1737 Kimberly Drive, Sunnyvale, Calif. 94087

Division of Ser. No. 342,231, March 16, 1973, Pat. No. 3,858,784. This application Sept. 5, 1974, Ser. No. 503,531

Int. Cl.² F27D *5/00, 13/00*

U.S. Cl. 432—5 **4 Claims**



1. A method of handling a die support frame comprising: positioning the frame in a substantially vertical plane; advancing the frame through an incremental distance; applying a drag force to the frame as it moves through a first portion of said incremental distance; eliminating the drag force on the frame as the latter moves through a second portion of said incremental distance; heating a part of the frame after the frame is incrementally advanced; clamping the frame against movement as the same is being heated; and repeating the advancing, applying, heating and clamping steps.

3,975,144

CATHODE BAKING SYSTEM

Edward Jack Gates, Hot Springs, Ark., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 11, 1975, Ser. No. 557,315

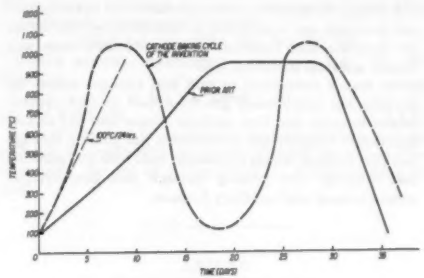
Int. Cl.² F27D *5/00*

U.S. Cl. 432—5 **8 Claims**

1. In the art of baking elongated green carbon blocks prepared from a mixture consisting essentially of a carbonaceous aggregate and from about 28% to about 35% pitch based on the weight of said mixture, the improvement which comprises:

supporting the green blocks upright on their ends within packing of calcined fluid coke in a baking furnace; and

heating the thusly supported blocks to a temperature of about 950°–1250°C., wherein said heating through the



range of 250° to 550°C. proceeds at a rate in excess of 100°C./24 hours.

3,975,145

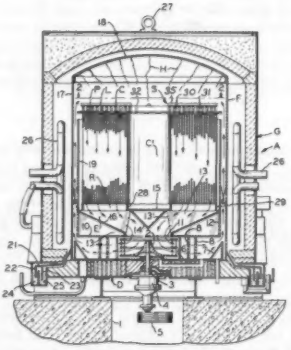
OPEN COIL HEAT SHIELDING

Robert R. Hill, Westlake, and Robert J. Beemer, Bay Village, both of Ohio, assignors to Lee Wilson Engineering Company, Inc., Cleveland, Ohio

Division of Ser. No. 465,428, April 29, 1974, Pat. No. 3,904,356. This application Mar. 26, 1975, Ser. No. 562,251

Int. Cl.² F27D *23/00*; F27B *21/00*

U.S. Cl. 432—10 11 Claims



10. A process for heat treating an open coil having a free end and formed of convolutions of metal strip spirally wound about the axis of the coil and separated by spaces that permit passage of treating gas between such convolutions, which process comprises passing treating gas through said spaces between said coil convolutions of said coil under heat conditions including radiant heat that is directed, from a source outside of said coil, laterally of and axially toward said free end of said coil and that tends to cause substantial distortions of the spaced free end portions of said spaced convolutions of said coil at said free end of said coil, and substantially completely shielding said spaced free end portions of said spaced convolutions of said coil from harmful direct impingement of said radiant heat on said spaced free end portions of said spaced convolutions of said coil while permitting adequate flow of treating gas through said radiant heat and between said coil convolutions for treating purposes.

3,975,146

FIXING THERMOPLASTIC MATERIAL ON A CARRIER

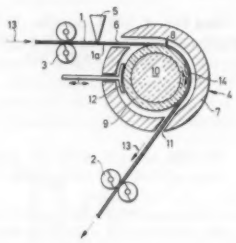
Wolfram Saupe, Mammolshain, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 315,799, Dec. 18, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,789

Claims priority, application Germany, Dec. 20, 1971, 2163136

Int. Cl.² F27B *9/28*

U.S. Cl. 432—59 6 Claims



1. An apparatus for heat-fixing a heat fixable material to a carrier material

comprising an insulating housing having a slit therein through which passes the carrier material, means to move said material through said housing at one speed, a friction roller positioned within said housing about which said carrier material is passed, a movable friction element contactable with said friction roller for creating heat on the surface of said roller at a location where said carrier material does not pass about said roller and means to drive said roller at a speed different from the speed of said material.

3,975,147

ROTARY KILN

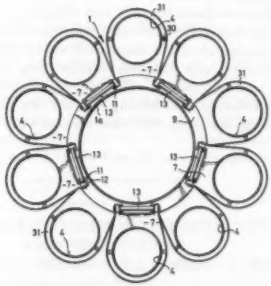
Antonius Vering, Vorhelm, and Bernhard Loffler, Warendorf, both of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed May 14, 1975, Ser. No. 577,197

Claims priority, application Germany, May 17, 1974, 2424224

Int. Cl.² F27B *7/02*, *7/38*

U.S. Cl. 432—80 10 Claims



1. In a rotary kiln having a plurality of satellite cooling tubes distributed uniformly around the periphery of said kiln, each of said cooling tubes having an inlet at one end thereof in communication with the interior of said kiln, the improvement comprising a pair of mounting devices for each of said cooling tubes to couple the latter to said kiln at axially spaced points,

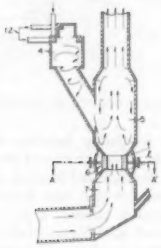
pivotal means connecting at least one of said pair of mounting devices to said kiln, and pivotal means connecting the other of said pair of mounting devices to said cooling tube, the respective pivotal means defining pivotal axes enabling relative axial movement of said cooling tubes and said kiln.

3,975,148

APPARATUS FOR CALCINING CEMENT

Yoshiharu Fukuda, Tokyo, and Yoshihiko Ueda, Musahino, both of Japan, assignors to Onoda Cement Company, Ltd., Japan

Filed Feb. 4, 1975, Ser. No. 547,088
Claims priority, application Japan, Feb. 19, 1974, 49-19352
Int. Cl.[2] F27B 7/02
U.S. Cl. 432—106 **1 Claim**



1. An apparatus for calcining suspended cementatious material, said apparatus comprising:

material feed means for feeding said cementatious material to be calcined into said apparatus;

at least one first cyclone preheating means adapted to receive and heat said material from said feeding means;

auxiliary furnace means connected to said first cyclone means adapted to receive said material from said first cyclone means for heating and calcining said preheated material entering thereinto from said first cyclone means;

kiln means for producing combustion gas, said kiln means having an inlet thereinto;

mixing chamber means connected between said inlet to said kiln means and said auxiliary furnace means for mixing said heated material from said auxiliary furnace with said combustion gas from said kiln means;

throttling means between said inlet to said kiln means and said mixing chamber means for adjusting the amount of combustion gas entering said mixing chamber means from said kiln means, said throttling means comprised of a quadrilateral flue having at least one movable wall for adjusting the cross-sectional area of said flue;

at least one second cyclone means connected to said mixing chamber means for receiving said heated material and combustion gas from said mixing chamber and for separating said material from said combustion gas, said second cyclone means further connected to the inlet of said kiln means for directing said separated and heated material thereinto and connected to said first cyclone means for directing said combustion gas separated from said heated material thereinto; and

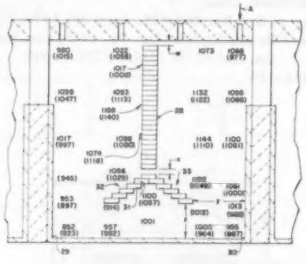
exhaust means connected to said first cyclone means for drawing the combustion gas from said second cyclone means through said first cyclone means and out of said apparatus, whereby the combustion gas passing through said first cyclone means exchanges heat with and preheats said material also passing through said first cyclone means toward said auxiliary furnace.

3,975,149

RING FURNACE

Bernard J. Racunas, New Kensington, and Raymond Kastelic, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 23, 1975, Ser. No. 570,730
Int. Cl.[2] F27B 5/14, 13/12
U.S. Cl. 432—209 **2 Claims**



1. A ring furnace including pits bounded laterally by upright side wall flues, the side wall flues being connected in series by means for conducting gases from an outlet upper corner region of one flue to an inlet upper corner region of the next flue in the series, the outlet upper corner region of any given flue being opposite to its inlet upper corner region, so that heat in previously fired side wall flues can preheat air for combustion in a fired side wall flue and exhaust gases from the fired side wall flue can give up heat to articles in pits bounded by yet-to-be-fired side wall flues, wherein the improvement comprises means for forming a Y-shaped baffle in at least one of said side wall flues, the Y being inverted and centered in the flue.

3,975,150
TRANSFER PRINTING PROCESS

Alfred Brack, Odenthal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 23, 1974, Ser. No. 500,186
Claims priority, application Germany, Aug. 24, 1973, 2342723
Int. Cl.² D06P *5/20*
U.S. Cl. 8—2.5 R **1 Claim**

1. In the process of transfer printing of synthetic and part-synthetic materials with an organic dyestuff the improvement comprising the use of 4-nitro-acridone as said organic dyestuff.

3,975,151
CLOTH RESERVE DYEING

Betsy Helen Berg, London, and Susana S. Szabo, Richmond, both of England, assignors to BSG Designs Inc., London, England

Filed Aug. 13, 1973, Ser. No. 387,772
Int. Cl.² D06P *7/00*
U.S. Cl. 8—14 **8 Claims**

1. Method of pattern dyeing which comprises folding a fabric and forming a succession of fabric areas lying side by side; clamping the folded fabric to urge adjacent areas together and form a compact block of the fabric to restrict dyestuff access to parts of the areas internally of the block and leave parts of the areas towards the exterior of the block accessible to the dyestuff; applying at least one dye liquor and thereby at least two different dyestuffs to the exterior of the block, one dyestuff having a faster speed of diffusion between the said parts of the areas to which dyestuff access is restricted than the other dyestuff, and next treating the block to diffuse the one dyestuff from the exterior of the block into the parts of to the areas of restricted dyestuff access and leave the other dyestuff substantially on parts of the areas accessible to dyestuff and separate the one dyestuff at least partly from the other dyestuff in each of the areas lying side by side.

3,975,152
SIMULTANEOUS DYEING AND CROSSLINKING OF CELLULOSIC FABRICS

Robert J. Harper, Jr., Metairie; Joseph S. Bruno, Chalmette; Eugene J. Blanchard, New Orleans, and Gloria A. Gautreaux, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 395,097, Sept. 7, 1973, Pat. No. 3,871,817. This application Jan. 23, 1975, Ser. No. 543,616
Int. Cl.² D06P *5/00*
U.S. Cl. 8—17 **3 Claims**

1. A process for printing cellulosic containing fabric with basic dyes, said process comprising:

a. padding the fabric with an aqueous solution containing dimethylol dihydroxyethyleneurea, and about 0.5 to 4.0 weight percent of an acid catalyst selected from the group consisting of:
zinc nitrate hexahydrate,
magnesium chloride hexahydrate,
citric acid,
tartaric acid,
glycolic acid,
mandelic acid, and
a mixture of magnesium chloride hexahydrate with any of citric, tartaric, glycolic or mandelic acid in 1:1 or 1:3 ratios,

b. drying the fabric from (a) at a temperature from 30° to 90° C for a period of 2 to 30 minutes,

c. printing the fabric from (b) with an aqueous formulation comprising:
0.5 to 3.0 weight percent basic dye, and
0.0 to 1.0 weight percent hydroxyethylcellulose,

d. drying the printed fabric from (c) at a temperature from 30° to 90° C for a period of 2 to 30 minutes, and

e. curing the fabric from (d) at a temperature of 120° to 160° C for a period from about 5 to 15 minutes.

3,975,153
ACTIVATION OF PEROXYGEN BLEACHES USING ISOPHORONE ENOL ACETATES AND ISOPHORONE OXIMINOACETATE

Harry Dounchis, Lawrenceville, and Fui-Tseng H. Lee, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 25, 1975, Ser. No. 607,191
Int. Cl.² D06L *3/02;* **C11D** *7/54, 9/42*
U.S. Cl. 8—111 **2 Claims**

1. In the method of simultaneously laundering and bleaching fabrics in which the operation is carried out above ambient temperatures and below 80°C and the bleaching is effected with a peroxygen compound which yields peroxide ion in the laundering bath and an activator therefor which sharply increases the activity of said peroxygen compound at these temperatures, the improvement which consists in using as the activator at least one-half mol, per mol of active oxygen compound, of an isophorone derivative of the group consisting of isophorone enol acetates and isophorone oximinoacetate, the activators being characterized by low odor, toxicity and skin-irritating properties.

3,975,154
PROCESS FOR PRODUCING AND UTILIZING DURABLE PRESS FABRICS WITH STRONG ACID GRAFTS

Robert J. Harper, Jr.; Gloria A. Gautreaux, both of Metairie, and Joseph S. Bruno, Chalmette, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 9, 1975, Ser. No. 585,213
Int. Cl.² D06M *1/14, 13/38, 13/30*
U.S. Cl. 8—116 P **6 Claims**

1. A process for preparing a crosslinked cellulosic fabric possessing strong acid grafted groups, the process comprising:

a. impregnating the cellulosic textile with a formulation consisting of about from 1% to 15% of the crosslinking agent dimethylol dihydroxyethyleneurea, dihydroxyethyleneurea, 0.1 to 4% of a zinc nitrate base catalyst and from 1% to 10% of a hydroxyalkyl sulfonic or hydroxyalkyl phosphinic acid salt,

b. drying the wet impregnated textile from about 2 minutes to 2 hrs. at temperatures from 25° to 100°C,

c. curing the dry impregnated textile about from 100°C to 200°C for periods of 20 seconds to 30 minutes, using longer periods of time with the lower temperatures,

d. washing the cured fabric free of excess reagents.

3,975,155
QUANTITATIVE METHOD FOR DETECTING 3-ISOTHIAZOLONES

Wolfgang G. Geyer, Glassboro, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed June 4, 1975, Ser. No. 583,821
Int. Cl.² G01N *31/06, 31/22, 33/20*
U.S. Cl. 23—230 R **9 Claims**

1. A quantitative method for the colorimetric determination of microlevels of substituted and unsubstituted isothiazolones which comprises: adsorbing the isothiazolone on a support; reductively cleaving the S-N bond of the isothiazolone ring with a hydride selected from the group consisting of sodium

borohydride, lithium borohydride, and alkyl aluminum hydride to form a thiol; adding a color forming reagent to the cleaved compound; and determining the concentration of the isothiazolone by colorimetry.

3,975,156

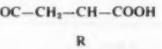
METHOD AND MATERIAL FOR DETECTING AND QUANTITATING FETAL ERYTHROCYTES IN ADULTS

Patricia J. Kraft, Somerville; Marcia R. Thomas, Neshanic Station, and Larry A. Kraft, Somerville, all of N.J., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Nov. 10, 1975, Ser. No. 630,597
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **15 Claims**

1. In a method of measuring the number of fetal erythrocytes relative to adult erythrocytes in adult blood which has the steps of: (A) preparing a smear of said blood on a glass slide; (B) fixing said smear on said slide; (C) differentially eluting said adult erythrocytes of said smear relative to said fetal erythrocytes with an eluting buffer; (D) staining said slide with a protein-staining material; and (E) measuring the number of stained fetal erythrocytes and adult erythrocytes on at least a portion of the slide;

The improvement wherein the eluting buffer comprises an aqueous solution of an acid of formula:



wherein R is a member selected from the group consisting of hydrogen and hydroxy, and a salt thereof wherein the cation of said salt is a member selected from the group consisting of alkali metal ions of atomic weight less than 133 and alkaline earth metal ions of atomic weight less than 138.

9. A method for preparing a concentrated malic acid/malate buffer which is conveniently evaporated to produce an indefinitely stable, solid buffer material, which material may be reconstituted by addition of water to a buffer having a known pH and no pH shift; which method comprises the steps of:

A. preparing a concentrated aqueous solution of malic acid;

B. heating said malic acid solution at a temperature and for a time sufficient such that no pH shift occurs on reconstitution of the solid buffer material with water; and

C. titrating this heated malic acid solution with a concentrated aqueous alkali metal hydroxide solution to a desired pH to yield a concentrated buffer solution.

3,975,157

GEOCHEMICAL EXPLORATION USING ISOPRENOIDS

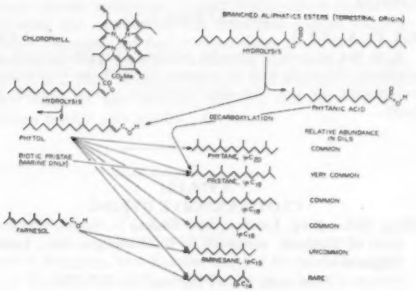
Melvin E. Smith, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 21, 1975, Ser. No. 597,605
Int. Cl.² G01N *31/08*
U.S. Cl. 23—230 EP **4 Claims**

1. A method for geochemical exploration comprising the steps of:

a. obtaining at least one rock sample from at least one location in the earth's crust; and

b. analyzing said sample for isoprenoids to determine the ratio between the relative concentration of the C_{20} isoprenoid and the sum of the C_{18} and C_{16} isoprenoids, wherein a ratio of less than 3:1 indicates a source rock.



3,975,158

ANALYSIS OF GENTIAN VIOLET RESIDUE IN TISSUE

Gregg W. Taylor, Murrayville, Ga., assignor to A.H.P., Inc., Gainesville, Ga.

Continuation-in-part of Ser. Nos. 342,290, March 16, 1973, Pat. No. 3,916,027, Ser. No. 454,000, March 22, 1974, Pat. No. 3,915,637, Ser. No. 595,876, July 14, 1975, Ser. No. 625,873, Oct. 24, 1975, and Ser. No. 625,693, Oct. 24, 1975.
This application Feb. 17, 1976, Ser. No. 658,760
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **9 Claims**

1. A process for the analysis of gentian violet in a material which comprises:

a. finely particulating a known amount of material containing gentian violet, unless such material is already in a finely divided state;

b. admixing a known amount of acidified ethanol with said finely particulated material and letting the resultant admixture stand, said acidified ethanol removing said gentian violet from said material;

c. separating said acidified ethanol (b) from said admixture (b) by centrifugation;

d. removing any spectrophotometrical interfering substance from said acidified ethanol (c) by passing said acidified ethanol (c) through a chromatograph column;

e. determining the amount of gentian violet in said acidified ethanol (d) and the background measurement of said acidified ethanol (d) by spectrophotometrical means;

f. quenching said gentian violet in said acidified ethanol (d) by adding to said acidified ethanol (d) a chemical substance which selectively renders said gentian violet nondetectable by spectrophotometric means without disturbing the spectrophotometric backgrund of said acidified ethanol;

g. determining the background measurement of said acidified ethanol (d) by spectrophotometrical means; and

h. calculating the quantitative amount of gentian violet in said material using the spectrophotometrical measurements of steps (e) and (g).

3,975,159
METHOD OF AND APPARATUS FOR DETERMINING THE OZONE CONTENTS OF GAS MIXTURES

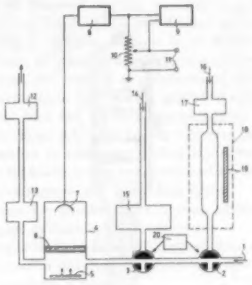
Sybrandus van Heusden, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1975, Ser. No. 558,019

Claims priority, application Netherlands, Mar. 18, 1974, 7403566

Int. Cl.² G01N *21/26*

U.S. Cl. 23—232 E **1 Claim**



1. In the method for determining the ozone content of a gas mixture by measuring the intensity of chemiluminescent light emitted from an organic compound exposed thereto, the improvement wherein the organic compound is mixed with gallic acid and is an organic dye selected from the group consisting of eosin, erythrosin, cyanosin and Rose Bengal.

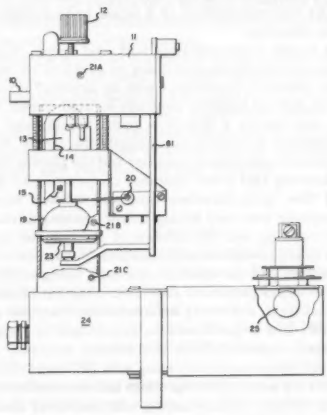
3,975,160
COLORIMETRIC ANALYZER

Thomas L. Bohl, Clearwater; Lyman E. Goodnight, Jr., St. Petersburg; Herschel C. Ruble, Clearwater, and John H. Wells, Seminole, all of Fla., assignors to Milton Roy Company, St. Petersburg, Fla.

Filed July 29, 1974, Ser. No. 492,725

Int. Cl.² G01N *21/24*

U.S. Cl. 23—253 R **17 Claims**



1. A colorimetric analyzer for automatically and continuously measuring the transmission of light through a sample which has been mixed with reagents comprising:

a metering chamber for repeatedly metering precise volumes of said sample;

sampling means coupled to said metering chamber for supplying a volume of said sample thereto;

reagent dispensing means having an inlet adapted to receive a volume of a reagent and having an outlet coupled to an area within said analyzer in which a volume of said sample may be confined;

a measuring cell coupled to said metering chamber for receiving measured volumes of said sample;

a source of light positioned to direct light through a volume of sample disposed in said measuring cell;

a photocell positioned for receiving light from said source which has traversed the sample disposed in said measuring cell;

means coupling said metering chamber and said measuring cell for transferring said sample to said measuring cell so that the transmission of light from said source through the reacted mixture in said cell is measured by said photocell;

indicator means;

sample and hold circuit means coupling said photocell and said indicator means for applying the output of said photocell to said indicator means; and

timing means actuating said sample and hold circuit means during time intervals when the reaction of said sample and reagents has been completed.

3,975,161
BIOLOGICAL DIAGNOSTIC TEST STRIP

Vlastimil Svoboda, and Olga Celechovska, both of Brno, Czechoslovakia, assignors to Lachema, narodni podnik, Brno, Czechoslovakia

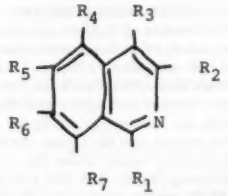
Filed Nov. 6, 1975, Ser. No. 629,690

Claims priority, application Czechoslovakia, Feb. 14, 1975, 972-75

Int. Cl.² G01N *31/22, 33/16*

U.S. Cl. 23—253 **9 Claims**

1. Diagnostic test strip for the qualitative detection and the semi-quantitative estimation of blood and hemoglobin in biological materials comprising a bibulous carrier impregnated with a composition of matter comprising (a) an organic hydroperoxide or salt thereof, (b) an acid buffer, (c) a chromogen, (d) a wetting agent, (e) a solid polymeric film-forming natural or synthetic substance and (f) an agent capable of accelerating the peroxidase activity of hemoglobin characterized in that said agent is of the general formula



wherein R_1 – R_7 are selected from the group consisting of hydrogen, alkyl groups having from 1–2 carbon atoms and alkoxy groups having from 1–2 carbon atoms.

3,975,162
APPLYING REAGENT TO MEDIUM AND DEVICE THEREFOR

Donald W. Renn, Glen Cove, Maine, assignor to Marine Colloids, Inc., Rockland, Maine

Filed Mar. 13, 1974, Ser. No. 450,615

Int. Cl.² G01N *31/06, 33/16*

U.S. Cl. 23—253 TP **6 Claims**

1. The process of analyzing a specimen by subjecting it to a molecular diffusion separation procedure in a water-con-

taining solid medium and causing constituents of the specimen to react with a reagent in said medium, wherein the improvement comprises

providing a measured quantity of water-soluble or water-dispersible reagent incorporated within a solid film of solid film-forming organic polymer binder which is soluble in water to the extent of at least 1% by weight at 20°C.,

placing one face of said film in contact with said water-containing solid medium and maintaining it in contact for sufficient time to permit said reagent and binder to diffuse completely into said medium.

3,975,163
APPARATUS FOR THE RECOVERY OF FIBRILS MADE OF SYNTHETIC POLYMER

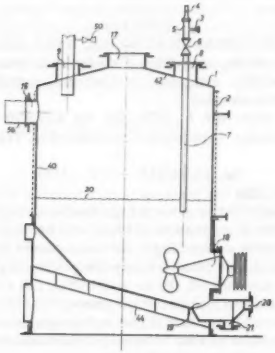
Rodolfo Gabellieri, Brussels, Belgium, and Carlo Raganato, Castiglioncello, Italy, assignors to Solvay & Cie, Brussels, Belgium

Filed Mar. 4, 1974, Ser. No. 448,040

Claims priority, application Luxemburg, Mar. 2, 1973, 67153

Int. Cl.² B01F *3/12, 7/06*

U.S. Cl. 23—272.6 R **8 Claims**



1. Apparatus for the recovery, in the form of a suspension in a liquid, of fibrils made of synthetic polymer which are in the presence of vapors of an organic solvent, comprising: a closed chamber for containing a liquid for suspending the fibrils and a gaseous atmosphere; a tubular pipe which extends inside the closed chamber and opens into the liquid for suspending the fibrils, the tubular pipe being for introducing the fibrils and solvent vapors into the closed chamber; means for discharging the solvent vapors from the closed chamber; means for introducing liquid into the closed chamber for suspending the fibrils; means for drawing off the suspension of fibrils from the closed chamber; means for controlling the pressure which prevails inside the closed chamber and preventing entry of air into the closed chamber; means for recycling to the closed chamber, a portion of the suspension of fibrils extracted by the means for drawing off the suspension of fibrils from the closed chamber; means in the closed chamber for stirring the liquid for suspending the fibrils; means for keeping the level of liquid for suspending the fibrils constant; means for introducing into the closed chamber vapors of the organic solvent which opens into the gaseous atmosphere and is regulated by the means for controlling the pressure; means for introducing into the closed chamber an inert gas which opens into the gaseous atmosphere and is regulated by the means for controlling the pressure; and means for thermostatting the closed chamber.

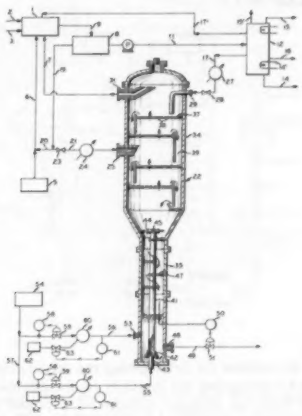
3,975,164
APPARATUS FOR PURIFYING HF CATALYST IN AN ALKYLATION PROCESS

Webster W. Brown, Jr., Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 5, 1975, Ser. No. 547,261

Int. Cl.² B01D *21/00, 43/00, 47/00;* **B01J** *8/08*

U.S. Cl. 23—288 H **4 Claims**



1. An apparatus for separating HF from an acid soluble oil, said apparatus including:

a. a column with an upper chamber and a lower chamber therein and having a lower portion of the upper chamber in open flow communication with an upper portion of the lower chamber, said lower chamber having a smaller cross sectional area than the upper chamber, said upper chamber being connected to said lower chamber by a frusto-conical portion;

b. a plurality of liquid-vapor contact trays mounted in said upper chamber in spaced apart relation;

c. a vent communicating with said upper chamber and adapted for exhaust of vapor from said upper chamber;

d. a conduit communicating with said upper chamber providing an inlet for introduction of a liquid hydrocarbon into said upper chamber;

e. first inlet means communicating with said upper chamber for feeding an acid phase containing an acid soluble oil into said upper chamber for contact with an isoparaffin vapor;

f. an elongate tubular member centrally located in said lower chamber and having a first flow path therethrough, said tubular member extending substantially the length of said lower chamber, said tubular member and the portion of said column defining said lower chamber cooperating to define a second flow path therebetween, said tubular member having opposite ends and having a flow opening at each of said ends opening into the interior of the column, one of said ends being positioned adjacent a lower portion of said lower chamber and the other of said ends being positioned adjacent an upper portion of said lower chamber and below said contact trays, deflecting means connected to the other of said ends and is positioned to direct flow of fluid and vapor radially outwardly from said tubular member;

g. second inlet means communicating with the lower chamber for introducing isoparaffin vapor into said second flow path;

h. third inlet means communicating with the lower chamber for introducing isoparaffin vapor into said first flow path; and

i. an outlet communicating with said lower chamber for removing acid soluble oil.

3,975,165

GRADED METAL-TO-CERAMIC STRUCTURE FOR HIGH TEMPERATURE ABRADABLE SEAL APPLICATIONS AND A METHOD OF PRODUCING SAID

Raymond John Elbert, Middleburg Heights, and Alan De Vere Butcher, Parma Heights, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,493
Int. Cl.² B22F *5/00, 7/00, 7/06;* **C04B** *39/12*
U.S. Cl. 29—182.2 **15 Claims**

1. A multi-layer composite, sintered, abradable seal, which is resistant to thermal cycling and has a porous, abradable ceramic surface layer which is resistant to high temperature oxidation and a metallic bottom layer bonded to a metallic substrate, with at least two intermediate layers of ceramic/metal mixture, the relative proportions of ceramic and metal in each intermediate layer being gradated with respect to the other layers, with the highest percentage of ceramic in the intermediate layer adjacent to the ceramic surface layer and the composition in each succeeding layer being successively gradated to be lower in the proportion of ceramic with respect to the composition of the preceding layer.

15. Process for producing a porous abradable seal on a turbine engine surface which comprises:

a. forming a surface layer of desired thickness comprising particles of a ceramic material mixed with water and a binder to form a paste.

b. forming an intermediate layer of desired thickness comprising particles of said ceramic material mixed with particles of a chromium-containing superalloy, water and a binder to form a paste, placing said layer on top of said surface layer.

c. forming at least one additional intermediate layer as in step b, each such successive intermediate layer having a ratio of metal to ceramic gradated higher than that of the preceding intermediate layer, and placing each such additional intermediate layer on top of the preceding intermediate layer.

d. forming a metallic bottom layer of desired thickness comprising particles of a chromium-containing thickness comprising particles of a chromium-containing superalloy mixed with a brazing aid and water to form a paste, placing said metallic layer on top of the last intermediate layer.

e. restraining the assembled layers in a suitable fixture under an initial pressure of at least 175 kilograms per square centimeter gauge and then slowly heating to dryness to thereby form a multi-layer composite.

f. coating the surface of a metallic substrate fixture with a brazing powder comprising metal powder of the type used in step d plus a brazing aid.

g. placing the dried composite on the coated metallic substrate, with the metallic bottom layer in contact with said substrate, and heating to a temperature of at least 1100°C in an inert or reducing atmosphere, under a pressure sufficient to maintain said composite in contact with said substrate for a time sufficient to sinter said composite and bond said composite to said substrate.

3,975,166

GELLED ACRYLIC POLYMER

Howard Julian Troffkin, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1966, Ser. No. 605,148
Int. Cl.² C10L *7/02*
U.S. Cl. 44—7 D **5 Claims**

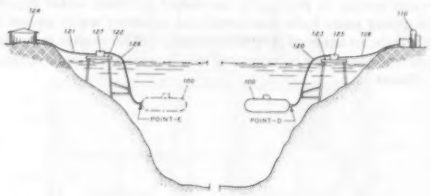
1. A composition of matter comprising (A) from about 25% to about 75% of acrylonitrile, (B) from about 1.5% to about 15% of an acrylonitrile-soluble, nitrile group-containing acrylic polymer having an intrinsic viscosity ranging from about 2.0 to about 5.0 dl./g and (C) from 25% to about 75%, of a liquid dicyanamide derivative gelling agent selected from the group consisting of isopropyl dicyanamide and 1,1-dimethyl-2,2-dicyanohydrazine, said percentages being by weight based on the total weight of the ultimate composition.

3,975,167

TRANSPORTATION OF NATURAL GAS AS A HYDRATE

Albert J. Nierman, Dhahran, Saudi Arabia, assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 2, 1975, Ser. No. 564,394
Int. Cl.² F17C *13/00*
U.S. Cl. 48—190 **30 Claims**



1. A method for transporting a natural gas from a well to a point of use while utilizing the effect of pressure and temperature at the specific water elevation of a submarine vessel as an aid in hydrating said gas, comprising the steps of:

supplying gaseous hydrate-forming hydrocarbons from a source of said gas to a submarine vessel while simultaneously pressurizing and cooling said gaseous hydrocarbons on said vessel to a temperature and pressure at which said hydrocarbons hydrate;

hydrating said hydrocarbons in said vessel;

submerging and moving said submarine vessel to the vicinity of a point of use while maintaining said natural gas in a hydrated form;

raising said submarine vessel to the surface and thereby reducing the pressure and increasing the temperature of said vessel;

providing additional heat to said vessel so that said hydrated hydrocarbons in the presence of said reduced pressure and raised temperature gasifies; and

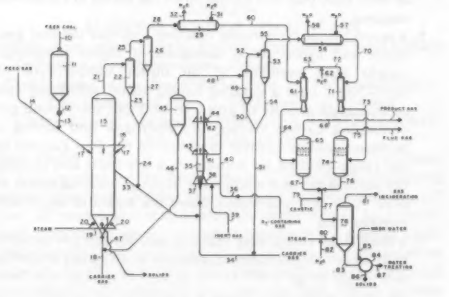
transferring said gasified hydrocarbons to a point of use.

3,975,168

PROCESS FOR GASIFYING CARBONACEOUS SOLIDS AND REMOVING TOXIC CONSTITUENTS FROM AQUEOUS EFFLUENTS

Martin L. Gorbaty, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 2, 1975, Ser. No. 564,385
Int. Cl.² C10K *1/06;* **C10J** *3/54*
U.S. Cl. 48—197 R **10 Claims**



8. In a gasification process wherein a solid carbonaceous feed material is reacted with steam to produce a raw product

gas containing methane, hydrogen, carbon monoxide, carbon dioxide, and hydrogen sulfide and wherein heat is generated by the combustion of carbonaceous solids to produce a raw flue gas having a lower hydrogen sulfide content than said raw product gas and including volatile toxic trace element constituents, the improvement which comprises scrubbing said raw product gas with water to produce a product gas scrubber water stream containing hydrogen sulfide removed from said product gas, scrubbing said raw flue gas with water to produce a flue gas scrubber water stream containing toxic trace element constituents removed from said flue gas, combining said product gas scrubber water stream and said flue gas scrubber water stream to produce a combined scrubber water stream, stripping gases from said combined scrubber water stream to produce an aqueous stripper effluent, and thereafter removing precipitated trace element sulfides from said aqueous stripper effluent.

3,975,169

PROCESS FOR PRODUCING A NATURAL GAS SUBSTITUTE

Colin William Gent, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 325,733, Jan. 22, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 533,175

Claims priority, application United Kingdom, Jan. 26, 1972, 3685/72

Int. Cl.[2] C10G *11/28*

U.S. Cl. 48—214 A **15 Claims**

1. A process for producing a natural gas substitute at least partly from a hydrocarbon feedstock of higher molecular weight than methane which comprises:

a. a first stage comprising reacting a hydrocarbon feedstock that is methane or is partly or wholly of a higher molecular weight than methane at a pressure in the range of 5–40 ata with steam in an externally heated tubular catalytic steam reforming process at an outlet temperature in the range 600°–900°C to give a first gas containing carbon oxides and hydrogen but under 30% of methane by volume on a dry basis and cooling the flue gases from the furnace of said externally heated tubular catalytic steam reforming process in a waste-heat boiler producing steam at over 1000 psig and letting down the steam in expansion engines;

b. a second stage comprising reacting together the first gas, steam and hydrocarbon feedstock of higher molecular weight than methane at an outlet temperature of 600°–700°C over a catalyst having steam reforming and methanation activity to give a second gas, the second gas containing carbon oxides and hydrogen and having a methane content greater than that of the first gas and in the range 20–40% by volume on a dry basis and cooling the second gas in a waste-heat boiler producing steam at over 1000 psig and letting down the steam in expansion engines; and

c. a third stage comprising reacting said second gas catalytically under methanating conditions at an outlet temperature in the range 250°–450°C in heat exchange with boiling water generating steam in which the steam generated by the said heat exchange with boiling water is at a pressure over 1000 psig and is therafter let down in expansion engines, whereby heat is continuously removed.

3,975,170

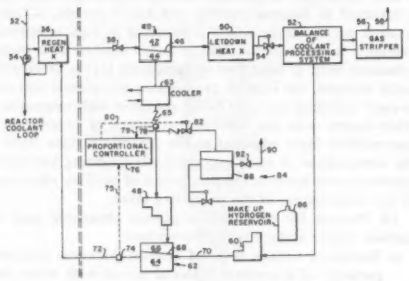
HYDROGEN CONCENTRATION CONTROL UTILIZING A HYDROGEN PERMEABLE MEMBRANE

Stephen Joseph Keating, Jr., West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 418,342, Nov. 23, 1973, abandoned. This application May 13, 1974, Ser. No. 469,259

Int. Cl.[2] B01D *53/22*

U.S. Cl. 55—16 **3 Claims**



1. A method of controlling hydrogen concentration of the fluid in the reactor coolant system of a nuclear reactor system comprising the steps of:

flowing a portion of said reactor coolant through the first chamber of a first diffusion cell separated into a first chamber and a second chamber by a first hydrogen permeable membrane;

maintaining a gradient of hydrogen partial pressure across said membrane sufficient to cause diffusion of substantially all hydrogen contained in said portion of coolant through said membrane;

removing other dissolved gases from said portion of reactor coolant fluid which has passed from said first chamber of said first diffusion cell;

flowing said portion of reactor coolant fluid through the first chamber of a second diffusion cell separated into a first chamber and a second chamber by a second hydrogen permeable membrane;

introducing a gas containing essentially hydrogen into said second chamber of said second diffusion cell; and

maintaining a gradient of hydrogen partial pressure across said second membrane sufficient to cause diffusion of hydrogen through said second membrane to said portion of reactor coolant to maintain the concentration of hydrogen in said coolant at a desired predetermined level.

3,975,171

APPARATUS AND METHOD FOR DEGASSING DRILLING FLUIDS

Gerald E. Burnham, Sr., 2000 W. St. Mary Blvd., and Gerald E. Burnham, Jr., 414 Karen Drive, both of Lafayette, La. 70501

Filed Oct. 14, 1975, Ser. No. 622,213

Int. Cl.[2] B01D *19/00*

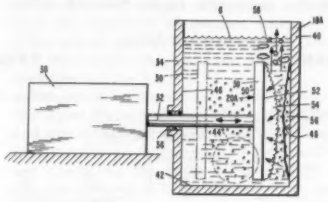
U.S. Cl. 55—36 **15 Claims**

1. Degassing apparatus for removing entrained gas bubbles from drilling fluid, comprising:

a conduit through which drilling fluid may flow, said conduit having a first surface and a second surface generally opposed to said first surface, both said surfaces being positioned to contact drilling fluid flowing through said conduit; and

a cavitator within said conduit, said cavitator having first and second surfaces respectively opposed to said conduit first and second surfaces, said cavitator being reciprocatable by drive means between a first position proximal said conduit first surface and a second position distal said conduit first surface and proximal said conduit second

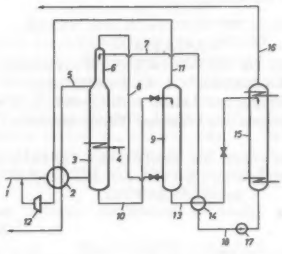
surface, whereby, during operation of said degassing apparatus, drilling fluid flowing through the conduit is alternately compressed and rarefied between the cavitator surfaces and the respective opposed conduit surfaces to promote coalescence of small entrained gas bubbles into larger bubbles which may rise more readily to the uppermost surface of the fluid for removal.



3,975,172
RECOVERY OF GASEOUS COMPONENTS FROM SCRUBBING LIQUID

Gerhard Ranke, Pocking, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Mar. 14, 1974, Ser. No. 451,044
Claims priority, application Germany, Mar. 14, 1973, 2312754
Int. Cl.² B01D *47/06*
U.S. Cl. 55—40 **12 Claims**

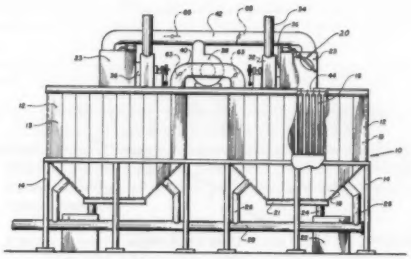


1. A process comprising the steps of (a) scrubbing raw gas with a scrubbing liquid so as to substantially free it from all components which are intended to be removed as impurities from the raw gas as well as a portion of components which are desired products, said raw gas being thereby converted into a first product gas, a part thereof being withdrawn as product; (b) further scrubbing another part of the first product gas with substantially completely regenerated scrubbing liquid, so as to free said part substantially completely from the remainder of said components desired as products in the first product gas, thus yielding a second product gas; (c) stripping resultant laden scrubbing liquid with said second product gas to obtain a laden stripping gas containing said portion of components which are desired products; and (d) subjecting resultant stripped scrubbing liquid to a final regeneration step to obtain a substantially completely regenerated scrubbing liquid.

3,975,173
METHOD FOR CLEANING GAS FILTER BAGS

Harley G. Peterson, La Crescenta, and Donald E. Crough, Placentia, both of Calif., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 478,898, June 13, 1974, abandoned.
This application July 2, 1975, Ser. No. 592,419
Int. Cl.² B01D *46/04*
U.S. Cl. 55—96 **2 Claims**



1. In a method of exhausting gas from a bag filter compartment into an exhaust passage of a filter unit, wherein a solids laden gas is passed from a primary source through filter bags located in the bag filter compartment and the resultant filtered gas is exhausted through the exhaust passage which is controllable by valve means, and wherein the valve means is periodically moved to close the exhaust passage and a cleaning gas is passed from a secondary source through said bags countercurrent to the flow of the solids laden gas and at an elevated pressure with respect to said solids laden gas, after which the valve means is moved to open the exhaust passage and the flow of cleaning gas is terminated, the improvement comprising the steps of: moving a first portion of said valve means from said exhaust passage to fully open only a restricted passageway between said compartment and said exhaust passage to allow a first predetermined relatively restricted flow of gas through said restricted passageway from said compartment to said exhaust passage and thereafter moving a second portion of said valve means from said exhaust passage to fully open said exhaust passage to allow a relatively unrestricted second predetermined flow of gas from said compartment to said exhaust passage.

3,975,174
MANUFACTURE OF FOAM GLASS

Pierre Camerlinck, Paris, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

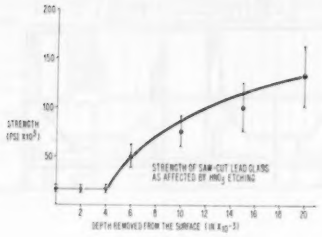
Continuation of Ser. No. 400,855, Sept. 26, 1973, abandoned.
This application Mar. 3, 1975, Ser. No. 554,566
Claims priority, application France, Oct. 9, 1972, 72.35649
Int. Cl.² C03B *19/08*
U.S. Cl. 65—22 **11 Claims**

1. A process for the manufacture of glass foam comprising admixing a finely divided glass having a viscosity between 10^6 and 10^7 poises at a temperature between 950°C. to 1100°C. with a foaming agent consisting essentially of stannic oxide and silicon carbide and heating said mixture to a temperature between 950°C. to 1100°C. for a time sufficient to cause said mixture to foam, said stannic oxide and said silicon carbide each being present in said foaming agent in an amount sufficient to generate sufficient carbon dioxide gas to foam said mixture.

3,975,175
PROCESS FOR INCREASING THE STRENGTH OF SEALING GLASS

Betty Jane Foster, Wappingers Falls; Perry Robert Langston, Jr., Poughkeepsie, and Rao Ramamohana Tummala, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1975, Ser. No. 590,651
Int. Cl.² C03C 15/00
U.S. Cl. 65—31 8 Claims



7. In a process for sealing a surface, in which an article of a low softening point high lead or alkaline earth oxide seal glass having a homogeneous composition is placed on said surface and is heated under mechanical pressure to soften the glass and is then cooled so that the glass forms a bond with said surface, the improvement which consists essentially of etching the surface of the article with a dilute solution of nitric acid, so as to remove a thin layer of from about 0.1 to 20 mils in thickness from the surface of the article prior to placing the article on said surface so as to increase the tensile strength of said article.

3,975,176
METHOD OF SEALING TUBULATION WITH PREFORMED SOLDER GLASS

Charles W. Salisbury, Risingsun, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

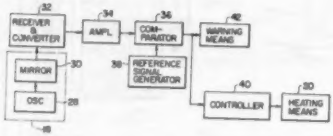
Filed Jan. 2, 1975, Ser. No. 537,895
Int. Cl.² C03B 23/24
U.S. Cl. 65—38 9 Claims

1. In the method of sealing the glass tubulation, inserted in a cavity of the glass substrate of a gaseous discharge display device, to the glass substrate with a solder glass by the application of heat, the improvement comprising preforming said solder glass into a homogeneous solidified glass annular member larger than said cavity and having a whole size slightly larger than the outside size of said tubulation, telescoping said annular member over the tubulation and bringing said annular member into overlying relationship and contact with said substrate, such that said annular member rests on the surface of said substrate, subjecting the entire display device to an elevated temperature sufficient to cause said solder glass of said annular member to flow and seal the substrate to the glass tubulation without voids or bubbles forming and no contamination but insufficient to cause deformation of said substrate and tubulation and cooling said display device.

3,975,177
SYSTEM FOR PREVENTING CRACKING OF GLASS RIBBON IN PLATE GLASS MANUFACTURING

Hiroshi Masuda, Matsusaka, Japan, assignor to Central Glass Co., Ltd., Ube, Japan

Filed Nov. 13, 1975, Ser. No. 631,435
Claims priority, application Japan, Nov. 14, 1974, 49-131341
Int. Cl.² C03B 18/02
U.S. Cl. 65—158 7 Claims



1. System for preventing cracking of a glass ribbon in plate glass manufacturing, which comprises:

scanning means for laterally scanning the glass ribbon by a laser beam emitting from a laser, while the glass ribbon is advanced on a molten metal confined by a bath, in order to detect at least one unmelted extraneous substance floating on the surface of the glass ribbon;

converting means for receiving the laser beam reflected to convert the same into a first electrical signal corresponding thereto, the reflected laser beam being changed in magnitude by the presence of the at least one unmelted extraneous substance;

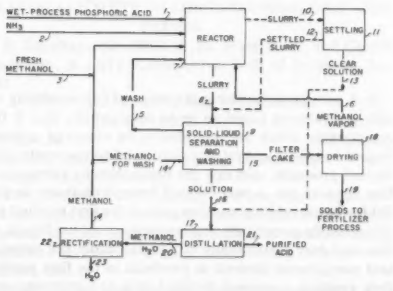
heating means being deposited in the vicinity of an exit of the bath for heating and softening the glass ribbon to prevent the cracking of the glass ribbon due to the unmelted extraneous substance, when the glass ribbon is picked up from the bath to a roller conveyor; and

controlling means for controlling energization of the heating means in response to the first electrical signal representative of the presence of the at least one unmelted extraneous substance.

3,975,178
PURIFICATION OF WET-PROCESS PHOSPHORIC ACID WITH METHANOL AND AMMONIA

John F. McCullough, and Leland L. Frederick, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 406,103, Oct. 12, 1973. This application May 28, 1974, Ser. No. 473,947
Int. Cl.² C05B 7/00
U.S. Cl. 71—34 7 Claims



1. The improved method for the partial purification of crude phosphoric acid prepared from phosphate rock and sulfuric acid and containing 50 to 55 percent P_2O_5 with coproduction of solid fertilizer material, said solid fertilizer

material containing 44–55 % P_2O_5 and 4–7% nitrogen and containing the substantial portion of the metallic and fluorine impurities originally present in the crude phosphoric acid, which improved method consists essentially of the steps of:

1. mixing said crude acid with methanol and ammonia while maintaining the temperature of the resulting mixture between 35°C and the boiling point for a period of time from 15 minutes to 90 minutes, wherein the mole ratio NH_3:P_2O_5 of said mixture is maintained from 0.26 to 0.40 and the weight ratio methanol:P_2O_5 of said mixture is maintained from 2.5 to 4.2;
2. subsequently separating the reaction mixture into a clarified liquid fraction consisting of aqueous phosphoric acid and ammonium phosphate dissolved in methanol and a solid fraction containing 44–55% P_2O_5 and 4–7% nitrogen and containing the major portion of the metallic and fluorine compounds originally present in the crude phosphoric acid;
3. subsequently separating the methanol from said clarified liquid fraction to obtain partially purified concentrated phosphoric acid;
4. subsequently removing phosphoric acid adhering to said solid fraction by washing with methanol and then evaporating methanol from washed solids to recover said solid fertilizer material.

3,975,179

HERBICIDE MIXTURES OF 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES AND THIAZOLES

Adolf Fischer, deceased, late of Mutterstadt, Germany by Caecilia Emma Fischer, legal representative, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 432,675, Jan. 11, 1974, Pat. No. 3,909,232, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Feb. 10, 1975, Ser. No. 548,390

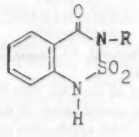
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N *9/12, 9/16*

U.S. Cl. 71—90 **8 Claims**

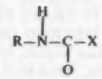
1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture of herbicides consisting essentially of

a. a compound of the formula



where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower alkyl amine, lower hydroxyalkyl amine or hydrazine salt thereof, and

b. a compound of the formula



where R denotes a 5-chloro-4-methylthiazol-2-yl radical and X denotes lower alkyl in a weight ratio *a:b* of 3:1 to 1:3.

3,975,180

CRYSTALLINE ADDUCTS OF CARBAMOYL SULPHOXIDES AND UREA IN A 1:3 RATIO

Franco Gozzo, S. Donato Milanese (Milan); Marcella Masoero, Milan; Ernesto Signorini, Mainate (Varese), and Riccardo Fabbrini, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

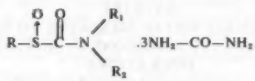
Filed June 6, 1975, Ser. No. 584,352

Claims priority, application Italy, June 7, 1974, 23725/74

Int. Cl.² A01N *9/14;* **C07C** *125/00, 127/00*

U.S. Cl. 71—103 **14 Claims**

1. A stable, crystalline adduct having the formula



in which:

R is benzyl or an alkyl having from 1 to 4 carbon atoms, and R_1 and R_2 may be the same or different and are alkyls having from 3 to 4 carbon atoms.

14. A process for inhibiting noxious plant growth which comprises scattering on or incorporating into the soil containing same at least 0.25 kg/ha of an adduct of claim 1.

3,975,181

HERBICIDAL COMPOSITION

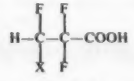
Shiro Watanabe, Osaka; Keiichi Maruo, Suita, and Hiroshi Ono, Shiga, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 864,560, Oct. 7, 1969, abandoned. This application Mar. 23, 1973, Ser. No. 344,450

Int. Cl.² A01N *9/24*

U.S. Cl. 71—113 **13 Claims**

1. A herbicidal composition for combating the undesirable vegetation of perennial weeds of Cyperaceae and Gramineae comprising at least one herbicide selected from the group consisting of monochloroacetic acid, trichloroacetic acid, α,α-dichloropropionic acid and salts and amides thereof, and at least one herbicidal compound selected from the group consisting of fluoropropionic acids of the formula:



wherein X is fluorine or chlorine, salts of said acids and amides of said acids.

3,975,182

PELLETS USEFUL IN SHAFT FURNACE DIRECT REDUCTION AND METHOD OF MAKING SAME

Harold E. Goetzman, Grand Rapids, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 386,893, Aug. 9, 1973, abandoned. This application Aug. 2, 1974, Ser. No. 494,108

Int. Cl.² C22B *1/08, 9/10*

U.S. Cl. 75—3 **19 Claims**

1. Method of making iron oxide pellets which will not form clusters in a vertical shaft moving bed countercurrent reducing furnace comprising:

a. preparing green pellets of ¼ to ¾ inches average diameter from an iron oxide containing composition selected from the group consisting of iron ore and iron ore concentrate having a composition of about 0.5 to about 3.0% silica, 7–12% moisture, and 96.5 to 99% iron oxide, and about 0.5% to about 1.0% bentonite as a binder,

b. forming a surface coating thereon of about 1% to about 4.5% of a material selected from the group consisting of lime, limestone and dolomite,

c. drying the pellets from about two to about six minutes at 500°F to 700°F,

d. in preparation for firing, preheating the pellets at about 1700°F to 2000°F, and

e. firing the pellets for about 5 to 15 minutes at a temperature of about 2100°F to 2400°F to form a hard surface containing calcium ferrite.

3,975,183

USE OF ALKALI METAL SILICATES TO REDUCE PARTICULATE EMISSIONS IN SINTERING OPERATIONS

Anthony E. Gross, Darien, and Larry J. Connelly, Oak Lawn, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 20, 1975, Ser. No. 560,065

Int. Cl.² C22B *1/08;* **C21B** *3/04*

U.S. Cl. 75—3 **5 Claims**

4. The method of claim 1 wherein the alkali metal silicate has an SiO_2 to Na_2O ratio of at least 1 and the amount applied to the sinter mix ranges between 0.01–1.0 pound per ton.

3,975,184

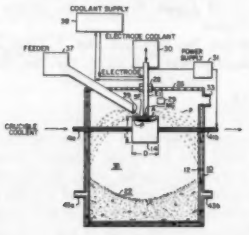
METHOD AND APPARATUS FOR PRODUCTION OF HIGH QUALITY POWDERS

Ronald R. Akers, Glenwood, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 8, 1974, Ser. No. 486,710

Int. Cl.² B22D *23/08*

U.S. Cl. 75—.5 B **33 Claims**



1. Powder producing apparatus comprising:

chamber means;

pool means disposed in said chamber means for containing a pool of molten material having a surface with associated surface tension;

electrode means disposed in said chamber means in spaced relationship with said surface of said pool, an electric arc of predetermined current value being struck between said electrode means and said surface of said pool of molten material, said pool means and said electrode means being energized at different electrical potentials to cause said electric arc to be struck and sustained; and

arc moving means for causing movement of said arc on said surface of said pool, said surface tension of said pool of material being overcome by a predetermined force related to said arc to enhance the giving up of liquid particles from said pool in the region of said arc for subsequent solidification.

3,975,185

PARTICULATE EMISSIONS REDUCTION IN SINTERING OPERATIONS

Anthony E. Gross, Darien, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 3, 1975, Ser. No. 564,590

Int. Cl.² C22B *1/16*

U.S. Cl. 75—5 **3 Claims**

1. A method of reducing the amount of finely divided particulate matter discharged in a sintering process of the type wherein a sinter mix comprising a shallow bed of fine particles comprising iron-bearing ores and fuel is agglomerated by igniting the mixture so as to produce porous coherent lumps followed by breaking the porous coherent lumps into useful sizes and then cooling the resulting particles by air, the improvement comprising spraying onto the sinter mix an aqueous solution of a water soluble lignosulfonate in a quantity sufficient to provide from 0.025 to 5 pounds of lignosulfonate per ton of sinter mix wherein particulate emissions from the forced air ignition of the fine particles and from the air cooling of the porous coherent lumps are substantially reduced.

3,975,186

METHOD OF MAKING IRON POWDER

Klaus Grebe, Kettwig; Hans de Haas, Meerbusch; Norbert Dautzenberg, Wegberg-Beeck, and Josef Hewing, Monchen-Gladbach, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 10, 1975, Ser. No. 611,858

Claims priority, application Germany, Sept. 12, 1974, 2443978

Int. Cl.² B22F *9/00;* **C21B** *15/00*

U.S. Cl. 75—.5 AA **17 Claims**

1. Method of making an iron powder in which the particles have a fiber-like configuration, comprising the steps of

providing grain iron oxide particles by spray calcinating a pickling solution that was used for pickling iron or steel;

reducing the iron oxide at a temperature in the range from 800° to 1000° C in an atmosphere which contains CO, but is substantially free from SO_3;

cooling the reduced product in a reducing or inert atmosphere; and

grinding the cooled product.

3,975,187

TREATMENT OF CARBOTHERMICALLY PRODUCED ALUMINUM

Robert M. Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 549,791, Feb. 13, 1975, abandoned, which is a continuation of Ser. No. 324,890, Jan. 18, 1973, abandoned. This application Sept. 9, 1975, Ser. No. 611,794

Int. Cl.² C22B *21/02*

U.S. Cl. 75—10 R **20 Claims**

1. A process for decreasing aluminum carbide contamination of aluminum produced by carbothermic processes, said process comprising:

A. preparing said aluminum contaminated with up to 20 weight percent of aluminum carbide as a melt at an initial temperature sufficiently high to keep said melt in a fluid state;

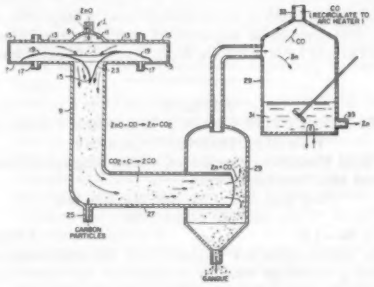
B. blowing said melt with a gas which comprises oxygen, air, carbon dioxide, steam, carbon monoxide, or a mixture of chlorine, nitrogen, and carbon monoxide, wherein chlorine is present in an amount no greater than about 20 weight percent, or mixtures of these gases for a sufficient period of time to prevent the formation of an aluminum-aluminum carbide matrix, whereby said aluminum carbide becomes readily separable from said aluminum;

C. separating said aluminum carbide from said aluminum in said melt.

3,975,188
ARC HEATER REDUCTION OF ZINC ROAST

Francis J. Harvey, II, Murrysville, and Maurice G. Fey, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1975, Ser. No. 603,577
Int. Cl.² C22D 7/06
U.S. Cl. 75—14 **5 Claims**



1. A process for the production of zinc comprising the steps of:

a. injecting powdered zinc roast into an arc heated gas stream consisting of an atmosphere of carbon monoxide to yield a downstream mixture of elemental vaporous zinc, carbon monoxide, carbon dioxide, and gangue,

b. injecting solid carbon particles into the downstream mixture to effect cooling of the mixture to a temperature slightly above the boiling point of zinc by an endothermic reaction of carbon dioxide and carbon to yield carbon monoxide and to prevent a back reaction of elemental zinc to zinc oxide, and

c. cooling the mixture to effect condensation of elemental zinc.

3,975,189
RECOVERY OF COPPER SULPHIDE AND NICKEL FROM SOLUTION

Leif R. Haugen, Kristiansand, Norway, assignor to Falconbridge Nickel Mines Limited, Toronto, Canada

Division of Ser. No. 125,862, March 18, 1971, Pat. No. 3,880,653. This application June 24, 1974, Ser. No. 482,533
Int. Cl.² C22B 23/04; C01G 3/12
U.S. Cl. 75—101 R **5 Claims**

1. Process for the recovery and separation of copper sulphide and nickel from aqueous nickeliferous solution containing dissolved copper comprising,

i. feeding nickel sulphide having an atomic ratio of nickel to sulphur greater than one to the nickeliferous solution thereby establishing a selected redox potential in the range of 30–250 mV and forming an agitated slurry thereof,

ii. reacting the nickel sulphide with dissolved copper in the solution in the presence of elemental sulphur at said selected redox potential, thereby precipitating copper sulphide and dissolving nickel in the nickeliferous solution,

iii. withdrawing copper sulphide and copper-depleted solution from the slurry,

iv. separating the copper sulphide from the copper-depleted solution, and

v. recovering nickel from the copper-depleted solution.

3,975,190
HYDROMETALLURGICAL TREATMENT OF NICKEL AND COPPER BEARING INTERMEDIATES

Sjaak Johan Van Der Meulen; Bauke Weizenbach, both of Fort Saskatchewan; Vladimir N. Mackiw, Islington, and Theodore Andrew Kinjerski, Bon Accord, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed May 23, 1975, Ser. No. 580,275
Int. Cl.² C22B 15/10, 23/04
U.S. Cl. 75—101 R **5 Claims**

1. A method of treating metal bearing intermediate materials which contain (a) one or more metals selected from the group consisting of nickel, cobalt and copper, (b) sulphide sulphur in an amount less than that required to combine stoichiometrically with said metals as sulphates and, optionally, (c) one or more precious metals selected from the group consisting of palladium, platinum, silver and gold, said method comprising the steps of: forming a slurry of finely divided particles of said materials in a substantially ammonia-free aqueous solution containing from about 25 to about 300 grams per liter of at least one sulphate salt selected from the group consisting of ammonium sulphate, sodium sulphate and nickel sulphate; adjusting the pH of said slurry to a level within the range of 4.5 – 6.5 and reacting said adjusted slurry at a temperature within the range of about 80° to about 180°C. under a positive partial pressure of oxygen with a free oxygen-containing gas; continuing said reaction to convert said group (a) metals to hydroxides; cooling the thus-reacted slurry to below about 100°C. and reducing the pressure to atmospheric; adding sulphuric acid to said cooled slurry in an amount sufficient to decrease the pH thereof to a value within the range of about 3 to about 4.5 and agitating said acid-treated slurry to dissolve said group (a) metal hydroxides in the solution, and separating solution containing dissolved group (a) metals from said acid-treated slurry.

3,975,191
METHOD OF PRODUCING CAST IRON

Franklin B. Rote, 5902 Rickfield - South, Jackson, Mich. 49203

Filed Nov. 25, 1974, Ser. No. 527,027
Int. Cl.² C22C 33/08
U.S. Cl. 75—130 R **12 Claims**

9. The method of producing cast iron by heating a metal charge and metallurgical coke in a cupola which includes the step of obtaining at least a portion of the desired carbon content of the iron by incorporating kish in a ground coal mixture to produce the coke.

3,975,192
DENTAL ALLOY AND AMALGAM

Harold H. Simpson, Fraser, Mich., assignor to Sybron Corporation, Rochester, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,247
Int. Cl.² C22C 7/00, 5/06
U.S. Cl. 75—169 **7 Claims**

1. A dental alloy which consists essentially of about 46 to 53 weight percent silver, 18 to 24 weight percent copper and 29 to 34 weight percent tin, and where the atomic percentage of

the total amount of silver plus copper is about 3 times greater than the atomic percentage of tin.

3,975,193

POWDER METALLURGY PROCESS FOR PRODUCING STAINLESS STEEL STOCK

Harbhajan S. Nayar, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 18, 1973, Ser. No. 352,386
Int. Cl.² B22F *1/00, 3/16*
U.S. Cl. 75—211 **11 Claims**

1. A powder metallurgy process for producing stainless steel stock having a low level of interstitials and properties equivalent to wrought stainless steel stock comprising the steps of:

providing an uncompacted particle mass formulated to yield metallic stock of a specific alloy composition, homogeneity level and purity level and having a ratio of oxygen to carbon plus sulfur of approximately 1.0:2.5;

heating said uncompacted particle mass in a protective atmosphere to purify the particles to the desired level by the reaction of said oxygen with said carbon and with said sulfur and sinter the particles to form a coherent mass having an interconnected porous structure through which gaseous reaction products are evolved;

ceasing said heating while said coherent mass substantially retains said interconnected porous structure and has a density less than 70% of its theoretical maximum; and

hot densifying said coherent mass in a protective atmosphere to cause at least a 40% reduction in cross section and substantial lateral flow in a single pass thereby removing all vestiges of interconnected porosity and bonding the particles together.

3,975,194

FORMATION OF HOLLOW SPHERICAL ARTICLES

Joseph Redmond Farnand, and Ira Edwin Puddington, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 4, 1974, Ser. No. 447,730
Int. Cl.² B22F *3/16, 9/00;* **B29D** *27/00*
U.S. Cl. 75—222 **13 Claims**

1. A method of forming hollow substantially spherical particles or balls of non-uniform wall cross-section comprising:

a. uniformly dispersing a soluble film-forming solid into a core solvent material which is a solid transformable directly into gas while the solvent material is in liquid form, the film-forming solid being present in a migratable amount of from about 0.5 to about 20% by wt. of the core solvent,

b. shaping the mixture comprising said two materials in at least about 62.5% of the total mixture, into substantially spherical particles or balls of a diameter not more than about 10mm. while the solvent is molten,

c. rapidly cooling said particles or balls to solidify the same,

d. slowly transforming the solid core material directly into a gas and removing the gas from said particles or balls without deformation thereof to cause migration of the film-forming material to the surface, the time for core removal being not less than about 0.5 hour, and sufficient to allow the migration to occur, and

e. recovering hollow substantially spherical particles or balls of said film-forming solid having a wall cross-section consisting of an outer skin and an inner sponge lining, the wall thickness being less than about 15% of the diameter.

3,975,195

MIGRATION IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. Nos. 725,676, May 1, 1968, and Ser. No. 460,377, June 1, 1965, and Ser. No. 483,675, Aug. 30, 1965, each is a continuation-in-part of Ser. No. 403,002, Oct. 12, 1964, abandoned, said Ser. No. 725,676, is a continuation-in-part of Ser. No. 460,377, June 1, 1965, and Ser. No. 483,675, Aug. 30, 1965, and Ser. No. 403,002, Oct. 12, 1964, abandoned. This application June 30, 1969, Ser. No. 837,780
The portion of the term of this patent subsequent to July 14, 1987, has been disclaimed.
Int. Cl.² G03G *13/22, 5/04*
U.S. Cl. 96—1 PS **19 Claims**

1. An imaging method comprising the steps of:

a. providing an imaging member comprising a layer of migration material spaced apart from at least one surface of, but contracting a softenable layer, said softenable layer capable of having its resistance to migration of migration material decreased sufficiently to allow migration of migration material in depth in said softenable layer;

b. applying an imagewise migration force to said migration material; and

c. developing said imaging member by decreasing the resistance of said softenable layer to migration of migration material in depth in the softenable layer at least sufficient to allow imagewise migration of migration material subject to said force at least in depth in said softenable layer.

3,975,196

PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEX FOR ELECTROPHOTOGRAPHY

Jean-Pierre Montillier, Manchester, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 20, 1972, Ser. No. 236,196
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.5 **3 Claims**

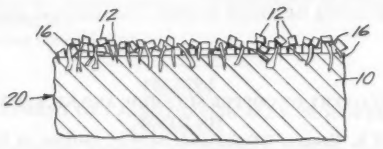
1. A photoconductive material for electrophotography comprising a charge transfer complex of 1,2 dicarbazolyl cyclobutane and 2,4,7-trintro-9-fluorenone, said dicarbazolyl cyclobutane and said trinitro-fluorenone being in a mole ratio of from about 1:0.5 to about 1:5.

3,975,197

COATED ALUMINUM SUBSTRATES

Valdis Mikelsons, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 331,372, Feb. 12, 1973, Pat. No. 3,871,881. This application Jan. 6, 1975, Ser. No. 538,928
Int. Cl.² B41N *1/08;* **C23F** *7/06*
U.S. Cl. 96—86 R **3 Claims**



1. An article suitable for providing a lithographic plate comprising an aluminum substrate, a hydrophilic coating overlying said aluminum substrate, said coating being provided by a hydrophilic particulate material bound to said aluminum substrate by an in situ formed aluminum hydroxyoxide, and an oleophilic layer overlying said hydrophilic coating, wherein said particulate material has an average particle size of about 0.05 to 3000 microns, a melting point

above about 150°C., and a water solubility of less than about 0.1 part per 100 parts of water at 100°C.

3,975,198

METHOD AND APPARATUS FOR MANUFACTURING A COLOR CATHODE RAY TUBE USING INTERCHANGEABLE SHADOW MASKS

Kazimir Palac, Carpentersville, and Raymond M. Stachniak, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 23, 1974, Ser. No. 535,614

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36.1 **2 Claims**

2. In the manufacture of a rectangular color cathode ray tube having an envelope including a funnel and a rectangular faceplate having a predetermined three-dimensional curvature, the method comprising:

providing a rectangular shadow mask blank which has a curved central portion whose curvature is closely related to the curvature of said faceplate, which has a stiffening peripheral portion causing said mask blank to be relatively stiff with respect to major and minor axes thereof yet relatively flexible with respect to diagonals thereof, and which has a mask suspension element in each corner thereof;

providing a mask master for receiving and rigidly mechanically supporting the mask blank whereby said mask blank may flex about a diagonal, if necessary to establish engagement with the mask master, and for supporting a mask master stencil in spaced adjacency to said mask blank;

providing a set of screening masters, including red, blue and green phosphor pattern masters having thereon interregistrable master stencil patterns, each screening master being curved similarly to the said faceplate each having a mechanical flexibility characteristic similar to that of said shadow mask blank, and each having on each corner a suspension element mechanically similar to said mask suspension elements;

photochemically forming in said central portion of said mask blank a pattern of electron-transmissive apertures, including photoexposing a photosensitive etchant-resistant coating on the concave side of the mask blank while using said mask master as a photographic stencil which supports said mask blank, said mask master during the photoexposure operation simulating a faceplate in its mechanical support for said mask blank;

photochemically depositing on a concave inner surface of said faceplate interleaved patterns of red-emissive, blue-emissive and green-emissive phosphor elements including photo-exposing a photosensitive coating on the concave surface of said faceplate a number of times while using said screening masters as photographic stencils, said screening masters being corner-mounted on said faceplate during the photoexposure operation so as to conform to said faceplate and thereby simulate a shadow mask in their mechanical influence on said faceplace; and

suspending the resultant mask adjacent said faceplate such that said pattern of mask apertures is registered with said patterns of phosphor elements on said faceplate.

3,975,199

SILVER HALIDE PHOTOGRAPHIC EMULSION

Hiroshi Yamashita, and Yutaka Sakasai, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

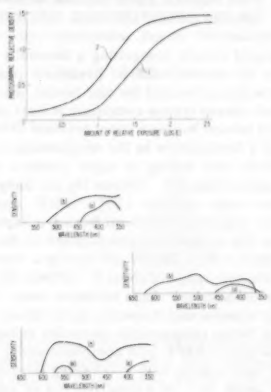
Filed Dec. 18, 1974, Ser. No. 534,120

Claims priority, application Japan, Dec. 18, 1973, 48-142205

Int. Cl.² G03C *1/28, 1/08*

U.S. Cl. 96—100 **12 Claims**

1. A silver halide photographic emulsion having improved sensitivity which comprises an emulsion containing photosensitive silver halide crystals and a sensitizing amount of at least one solid basic metal oxide selected from the group consisting



of magnesium oxide, calcium oxide and a compound oxide of zinc and aluminium.

3,975,200

MOULDING FOR THE HEAT RETENTION OF FEEDER HEAD IN CASTING MOLTEN METALS

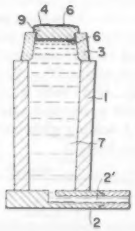
Masaru Takashima, Komae, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 460,048

Claims priority, application Japan, Jan. 23, 1974, 49-9921; Feb. 18, 1974, 49-18506; Mar. 9, 1974, 49-26778

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.22 **2 Claims**



1. A thermally expandable moulding for the heat retention of feeder head top surface comprising about 3 to 15% by weight of an organic binder, about 3 to 15% by weight of organic fibrous material, and the remainder consisting of a mixture of (i) pulverized charcoal which entirely passes through 10 mm. sieve and (ii) a thermo-expansible material selected from the group consisting of vermiculite, thermo-expansible graphite and mixtures thereof, the proportion by weight between said pulverized charcoal and said thermo-expansible material is 1:0.07 – 0.20 when the particle size of the pulverized charcoal is in the range from 10 mm. to 2 mm., and the proportion is 1:0.10 – 0.40 when the particle size of the pulverized charcoal is not more than 2 mm.

3,975,201

VEHICLE AND PRINTING PASTES FOR USE IN THE MANUFACTURE OF MICROELECTRONIC PACKAGES

Bernard Greenstein, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 15, 1973, Ser. No. 415,948

Int. Cl.² C08K *3/20, 3/40, 5/05, 5/10*

U.S. Cl. 106—48 **33 Claims**

1. In a liquid vehicle comprising a thermally stable binder which may be decomposed or pyrolyzed practically completely and a solvent system for said binder, the improvement wherein said solvent system comprises at least one low boiling temperature solvent having a vapor pressure of less than about 2mm Hg at a temperature in the temperature range of about 20°C.-25.20°C. and having a vapor pressure in the vapor pressure range of about 2 – 100mm Hg at a temperature in the temperature range of about 120° – 200°F., and at least one high boiling temperature solvent having a vapor pressure of about 1mm Hg or less at a temperature in the temperature range of about 120° – 200°F. and having a vapor pressure in the vapor pressure range of about 2 – 100mm Hg at a temperature in the temperature range of above about 200° to about 400°F., and wherein said thermally stable binder possesses the property of being substantially thermally stable at temperatures below about 200°F. and comprises about 10–35 weight percent of said vehicle, said low boiling temperature solvent comprises about 30 – 70 weight percent of said vehicle and said high boiling temperature solvent comprises about 20 – 40 weight percent of said vehicle.

14. In a printing paste including at least one finely divided, particulate inorganic material and a liquid vehicle comprising a thermally stable binder which may be decomposed or pyrolyzed practically completely and a solvent system for said binder, the improvement wherein said solvent system comprises a low boiling temperature solvent having a vapor pressure less than about 2mm Hg at a temperature in the temperature range of about 20° – 25°C. and having a vapor pressure in the vapor pressure range of about 2 – 100mm Hg at a temperature in the temperature range of about 120° – 200°F., and a high boiling temperature solvent having a vapor pressure in the vapor pressure range of about 1mm Hg or less at a temperature in the temperature range of about 120° – 200°F. and having a vapor pressure in the vapor pressure range of about 2 – 100mm Hg at a temperature in the temperature range of above about 200° to about 400°F., and wherein said thermally stable binder possesses the property of being substantially thermally stable at temperatures below about 200°F. and comprises about 10 – 35 weight percent of said vehicle, said low boiling temperature solvent comprises about 30 – 70 weight percent of said vehicle and said high boiling temperature solvent comprises about 20 – 40 weight percent of said vehicle, and wherein said vehicle comprises about 8–20 weight percent of said paste and said particulate inorganic material consists of a sealing glass comprising about 80–92 weight percent of said paste.

3,975,202

RIGID COHERENT GEL

Harold Garton Emblem, Bromley, and John Andrew McPherson, Mirfield, both of England, assignors to Zirconal Processes Limited, Bromley, England

Filed Oct. 2, 1973, Ser. No. 402,751

Claims priority, application United Kingdom, Oct. 4, 1972, 45809/72

Int. Cl.² C04B *35/02, 35/10*

U.S. Cl. 106—65 **12 Claims**

1. A method of producing a shaped refractory article comprising A. forming a castable gelable slurry by combining (1) a refractory aggregate; (2) a binder solution comprised of an aluminum hydroxyhalide of the formula $Al_2(OH)_nX_{(6-n)}mH_2O$ or a polymer thereof wherein n is a number less than 6, m is a number less than 4 and X is a chlorine, bromine or iodine atom, said aluminum hydroxyhalide being dissolved in water or a mixture of water and an alcohol, glycol, polyglycol or glycerol; and (3) an aqueous solution of ammonium acetate, ammonium lactate or magnesium acetate;

b. allowing said slurry to gel to a self-supporting state while maintaining it in the desired shape; and

c. then drying and firing the resulting article.

3,975,203

COMPOSITION FOR USE AS A FILLER IN TOOTH FILLING AND FACING COMPOSITION AND METHOD OF MAKING THE SAME

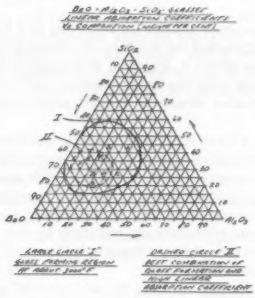
Earl D. Dietz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 158,547, June 30, 1971, Pat. No. 3,801,344, which is a division of Ser. No. 12,109, Feb. 17, 1970, abandoned. This application Feb. 20, 1974, Ser. No. 444,062

The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.² A61K *5/01;* **C08K** *3/22, 3/40*

U.S. Cl. 106—299 **21 Claims**



1. A composition for use as a filler in tooth filling and facing compositions comprising 50–90 parts by weight of a finely divided inorganic material and 10–50 parts by weight of a barium aluminosilicate glass having a BaO content than about 22.5 percent by weight, the facing and filling composition being radiopaque to X-rays used by dentists, having a color like that of natural teeth, an index of refraction like that of natural teeth, high strength and wear resistance, and a low coefficient of thermal expansion matching that of natural teeth and being non-toxic.

3,975,204

METHOD OF POST-HARVEST TREATMENT OF SUGAR CANE

Josef Zdarsky; Jan Rehor, and Rudolf Bretschneider, all of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed Apr. 30, 1975, Ser. No. 573,386

Claims priority, application Czechoslovakia, May 8, 1974, 3303-74

Int. Cl.² B01J *1/18;* **C13D** *1/00*

U.S. Cl. 127—42 **3 Claims**

1. A process of sugar cane treatment subsequent to harvesting and prior to processing of the sugar cane, consisting essentially of contacting the sugar cane stems with allyl isothiocyanate in the ratio of one weight part of allyl isothiocyanate to from 1,000 to 10,000 parts by weight of sugar cane stems.

3,975,205
PROCESS FOR WORKING UP MOLASSES

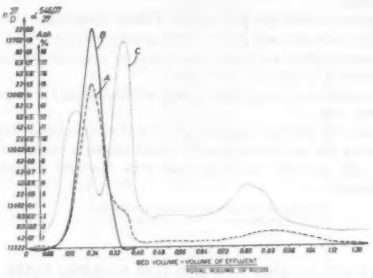
Mohammad Munir; Hubert Schiweck; Hans-Werner Weinz, all of Obrigheim, and Fritz Wurm, Offstein, all of Germany, assignors to Suddeutsche Zucker-Aktiengeselischaft, Mannheim, Germany

Filed Nov. 27, 1974, Ser. No. 527,799

Claims priority, application Germany, Dec. 14, 1973, 2362211

Int. Cl.² C13J *1/06*

U.S. Cl. 127—46 A **10 Claims**



1. A process for separating molasses into sugars and nonsugars by liquid distribution chromatography on cation exchangers in the calcium form in ion exchange columns arranged in series, comprising

a. placing 55–75% of the total cation exchanger in a first column and the remaining 45 to 25% in a second column,

b. supplying molasses to the first column,

c. eluting said first column with decarbonized water until sugar is detected in the eluate,

d. thereafter continuing elution and passing the sugar-containing eluate through said second column until sugar is detected in the eluate from said second column,

e. thereafter passing eluant through said second column but not through said first column and collecting the sugar-containing eluate from the second column,

f. discontinuing elution of said second column,

g. and separately eluting the non-sugars from said first column.

3,975,206
METHOD OF PEROXIDE THINNING GRANULAR STARCH

James A. Lotzgesell; Kenneth B. Moser, and Thomas L. Hurst, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 18, 1974, Ser. No. 524,727

Int. Cl.² C08B *31/18;* **C13L** *1/08*

U.S. Cl. 127—71 **11 Claims**

1. A process for thinning granular starch with hydrogen peroxide in the absence of buffering agents, the steps comprising, preparing an acidic pH aqueous slurry of said granular starch at a temperature below the gelatinization temperature of said starch, adding a minor amount of heavy metallic salt to provide a metal cation catalyst to said slurry, the metal cation catalyst being selected from the group consisting of iron, cobalt, copper, chromium and combinations thereof, and adding a minor amount of hydrogen peroxide to said aqueous slurry, said hydrogen peroxide being added in an amount sufficient to effect a thinning reaction to obtain the desired thinning without solubilizing the starch, whereby the pH of said aqueous slurry continues to decrease to a more acid condition during the thinning reaction.

3,975,207
METHOD OF TAKING OUT SCALE FROM POLYMERIZATION REACTOR

Mitsuaki Sugahara; Teizo Sato; Sakae Kobayashi, and Akira Kanekawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,428

Claims priority, application Japan, Nov. 27, 1974, 49-135625

Int. Cl.² B08B *7/04*

U.S. Cl. 134—6 **5 Claims**

1. In a method for removing scale which forms and accumulates during the polymerization of a vinyl monomer on the inner surfaces of the polymerization reactor and which is not removed when the contents of the reactor are discharged, wherein the scale is dislodged from the said surfaces by peeling the improvement which comprises: entrapping the scale particles which have been peeled from said surfaces by a net composed of fibrous strands which is placed into the reactor and permitted to come in contact with said particles.

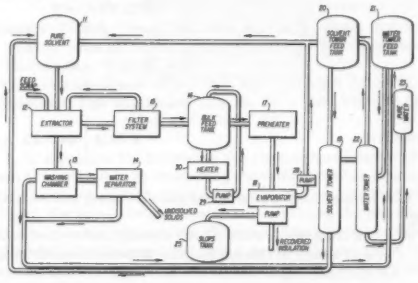
3,975,208
METHOD OF SELECTIVELY RECOVERING VINYL HALIDE INSULATION FROM INSULATED WIRE SCRAP

Stanley L. Tate; Bobby A. Rowland, both of Carrollton, Ga., and Michael M. Blackstone, Jacksonville, Fla., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 407,396, Oct. 17, 1973, abandoned. This application Jan. 23, 1975, Ser. No. 543,559

Int. Cl.² B08B *3/08, 7/04*

U.S. Cl. 134—10 **19 Claims**



1. A process for the continuous selective recovery of polyvinyl halide insulation selected from the group consisting of polyvinyl chloride, copolymers of polyvinyl chloride and mixtures thereof, from mixed insulated wire scrap, said mixed insulated wire scrap comprising wire scrap with mixtures of said polyvinyl halide and at least one insulation selected from the group consisting of polyethylene, crosslinked polyethylene, ethylene propylene rubber, polypropylene, teflon and nylon, comprising the steps of:

a. selectively dissolving polyvinyl halide insulation from the mixed insulated wire scrap with a solvent at a temperature at which the solvent is a specific solvent for the polyvinyl halide insulation and at which temperature the

solvent has substantially no solvent effect upon other insulations present in the mixed insulated wire scrap;

b. separating the undissolved portion of the insulated wire scrap from the dissolved polyvinyl halide insulation; and

c. maintaining a homogeneous solution of polyvinyl halide while recovering the dissolved polyvinyl halide from solution in a dry granular state suitable for extrusion upon wire.

3,975,209

THERMAL CELL WITH AN ANODE COMPRISING A MAGNESIUM ALLOY WITH A REFRACTORY OXIDE

Glenn F. Zellhoefer, Normal, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed June 21, 1965, Ser. No. 465,771
Int. Cl.² H01M *6/36*
U.S. Cl. 136—83 T **18 Claims**

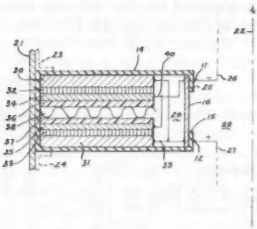
1. In a pellet type thermal cell including a mass of electrolyte, a depolarizing agent, a cathode, and an anode; the improvement wherein said anode comprises a pelletized mixture of a refractory oxide selected from the group consisting of zirconium oxide and alumina and an alloy containing from about 10 wt. % to about 20 wt. % lithium, from about 1 wt. % to about 6 wt. % aluminum, and the balance essentially magnesium, said refractory oxide being present in said anode in a minor amount sufficient to retard side reactions and general deterioration of the cell.

3,975,210

METAL-GAS BATTERY WITH AXIAL REACTANT GAS STORAGE CAVITY

Don R. Warnock, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1975, Ser. No. 563,010
Int. Cl.² H01M *8/02*
U.S. Cl. 136—86 A **1 Claim**



1. A hermetically sealed metal-gas secondary cell comprising:

a. A cell component stack of cell elements fabricated in the form of annuli of thin rectangular cross section, all having substantially equal annuli outside diameters and substantially equal annuli inside diameters and stacked to provide a cell having a common annulus axis, the said elements comprising:

1. a hydrophillic positive electrode fabricated from approximately 80 percent porous sintered nickel plaque on a perforated nickel sheet substrate impregnated with nickel-hydroxide,

2. a hydrophillic separator fabricated from asbestos,

3. a negative electrode fabricated from porous Teflon bonded with approximately 10 milligrams of platinum black catalyst per square centimeter of electrode area on approximately a 50 mesh nickel screen substrate,

4. a hydrophillic electrolyte reservoir fabricated from approximately 80 percent porous polysulfone having a nickel surface film,

5. a gas flow space provided by an open mesh polypropylene screen positioned adjacent the said electrolyte reservoir;

b. a hydrophobic annulus cell case of rectangular cross section enclosing the said cell component stack and providing a cell manifold volume within the said cell case;

c. a hermetically sealed pressure vessel containing the said cell case and providing an axial reactant gas storage volume in the space along the cell annulus axis inside the inner circumference of the cell case annulus;

d. a communicating port positioned on the inside circumference of the said cell case annulus between the said cell manifold volume and the said axial reactant gas storage volume;

e. a hydrophobic gas permeable Teflon membrane positioned over the said port in sealing relationship;

f. an electrolyte of potassium hydroxide in aqueous solution positioned in the said cell case;

g. hydrogen reactant gas positioned within the said pressure vessel; and

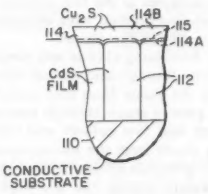
h. means for making separate electrical connections from exterior the said hermetically sealed pressure vessel with the said positive electrode and with the said negative electrode.

3,975,211

SOLAR CELLS AND METHOD FOR MAKING SAME

Fred A. Shirland, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1975, Ser. No. 563,421
Int. Cl.² H01L *31/04*; B05D *5/12*
U.S. Cl. 136—89 **6 Claims**



1. A method for making a solar cell structure comprising the steps:

a. dipping a polycrystalline CdS thin film into a solution containing cuprous ions, thereby forming a first polycrystalline Cu_2S thin film layer on said CdS film and

b. depositing a second Cu_2S layer on said first Cu_2S layer by vacuum deposition.

3. A method for making a solar cell structure comprising the steps:

a. depositing a polycrystalline thin film layer of CdS on a conductive substrate by vacuum deposition; and

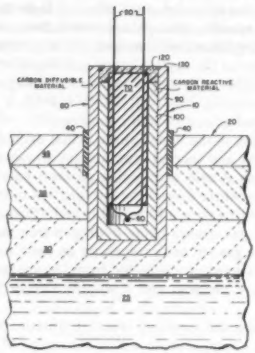
b. abruptly halting said CdS deposition while simultaneously abruptly initiating vacuum deposition of a polycrystalline thin film layer of Cu_2S on said CdS layer.

5. A solar cell comprising a conductive substrate, a polycrystalline CdS thin film layer disposed on said substrate, a polycrystalline Cu_2S thin film layer disposed on said CdS layer, said Cu_2S layer comprising an ion-exchange produced first thin portion penetrating only partly into the grain boundaries of the CdS layer and a vapor deposited second portion overlying said first thin portion, said second portion exceeding said first portion in thickness.

3,975,212
THERMOCOUPLE PROTECTIVE COMPOSITE TUBE

Warren E. Haupin, Lower Burrell, and John W. Luffy, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,245
Int. Cl.² H01L *35/02*
U.S. Cl. 136—232 **11 Claims**

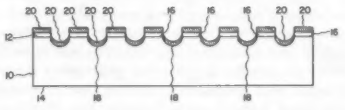


6. A thermocouple assembly comprising a thermocouple enclosed in a tube, said tube comprising an outer layer of material through which carbon in contact therewith can diffuse, and an inner layer of metallic material reactive with carbon, said inner layer in contact with said outer layer.

3,975,213
HIGH VOLTAGE DIODES

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 411,007, Oct. 30, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,481
The portion of the term of this patent subsequent to Dec. 4, 1992, has been disclaimed.
Int. Cl.² H01L *21/225*
U.S. Cl. 148—1.5 **21 Claims**



1. A process for making a high voltage diode comprising
a. selecting a body of semiconductor material having a predetermined level of resistivity, a predetermined type conductivity, a vertical axis which is substantially parallel with a first preferred crystal axis of the material, and two major opposed surfaces which are, respectively, the top and bottom surfaces thereof, at least one of the major surfaces having a preferred crystal planar orientation which is one selected from the group consisting of (111), (100) and (110);
b. vapor depositing an array of metal wires having a selected configuration on a major surface of the body, the metal comprising at least one material suitable for imparting to a portion of the material of the body a predetermined type conductivity and a predetermined level of resistivity, each wire being oriented substantially parallel with a second preferred axis of the material of the body;
c. heating the body and the array of metal wires to a predetermined elevated temperature sufficient to form an array of liquid wires of metal-rich semiconductor material on the surface of the body;
d. establishing a temperature gradient in the body substantially perpendicular to the two opposed major surfaces, the major surface having the array of liquid wires being at the lower temperature;
e. migrating the array of liquid metal wires entirely through the body from the major surface of lower temperature to the major surface of high temperature substantially parallel with the first crystal axis;
f. forming in situ in the body a plurality of spaced planar regions consisting of recrystallized semiconductor material of the body having solid solubility of the metal of the liquid wire therein, each region being formed by the migration of one particular liquid wire, the level of concentration of the at least one material being sufficient to impart a second and opposite type conductivity and the predetermined level of resistivity to each spaced planar region thereby forming a P-N junction at the abutting surfaces of the material of the spaced planar region and that of the body, the P-N junction being substantially perpendicular to the opposed major surfaces and a lamellar structure of integral diodes, each diode consisting of two planar regions of alternate and opposite type conductivity, and
g. providing suitable electrical means for shunting selected ones of the P-N junctions to electrically connect a plurality of the diodes formed in situ in the body into a series electrical circuit.

3,975,214
TANNIN CONTAINING COMPOSITIONS

Leonard Kulick, Ferndale, and Karim I. Saad, Sterling Heights, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 292,714, April 24, 1972, abandoned. This application July 26, 1974, Ser. No. 492,121
Int. Cl.² C23F *7/08*
U.S. Cl. 148—6.15 R **21 Claims**

1. In a process for improving the corrosion resistance of a steel or zinc surface by contacting the surface with an aqueous acidic zinc phosphate solution and thereafter painting the surface, the improvement comprising contacting the phosphatized surface with an aqueous chromium-free solution consisting essentially of a vegetable tannin in a concentration of 0.1 to 10 g/l and having a pH of less than 6 and above a value which will cause a degradation of the coating.

14. A process for the formulation and application of a tannin containing aqueous composition to a phosphatized metallic surface comprising:
1. forming a stable aqueous concentrate by dissolving in water
   a. 5 to 60 wt. % of a vegetable tannin; and
   b. alkali metal hydroxide in an amount sufficient to yield a pH of at least 7.5 in the concentrate;
2. thereafter diluting the concentrate with water to a tannin concentration not in excess of 10 g/l;
3. establishing a solution pH value of less than 6, by adding an acid if necessary; and
4. contacting the solution of reduced pH with the phosphatized surface.

3,975,215

CLEANER FOR TIN PLATED FERROUS METAL SURFACES

Edward A. Rodzewich, Flourtown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 405,187, Oct. 10, 1973, Pat. No. 3,888,783. This application Mar. 26, 1975, Ser. No. 562,285
Int. Cl.² C23F 7/08
U.S. Cl. 148—6.17 10 Claims

10. A method for treating tin-plated ferrous metal surfaces comprising the steps of:

a. cleaning the surface by contacting it with a solution having a pH from 9 to about 10.5, said solution consisting essentially of an alkali metasilicate in amount from about 0.75 grams/liter to about 3.0 grams/liter, an alkali metal condensed phosphate present in an amount from about 0.75 grams/liter to about 7.5 grams/liter, (and borax) wherein the condensed phosphate is selected from the group consisting of alkali metal, tripolyphosphate and alkali metal, pyrophosphate, and sodium borate present in an amount from about 3 to about 15 grams/liter,

b. rinsing the surface with water,

c. contacting the rinsed surface with a coating solution consisting essentially of monosodium monophosphate, disodium monophosphate, hydroxylammonium acid sulfate, ammonium bifluoride, and water,

d. rinsing the surface with water,

e. applying a sanitary lacquer to the surface.

3,975,216

WAX-FLUX COMPOSITION CONTAINING A DIESTER OF SULFOMALIC ACID FOR SOLDERING

Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 31, 1975, Ser. No. 545,944
Int. Cl.² B23K 35/34
U.S. Cl. 148—23 12 Claims

1. A wax-flux composition for use in a low-temperature soldering process, comprising:

A. a major amount of a wax having an average melting point between 40°C and 100°C, and

B. an amount effective to cause fluxing, at or below the soldering temperature, of the piece to be soldered in said process of a wax-soluble alkyl ester of sulfomalic acid.

3,975,217

FINELY DIVIDED MAGNETIC COBALT POWDER

Wasyl Kunda, Edmonton, Canada, and Winfried J. Huppmann, Stuttgart, Germany, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Division of Ser. No. 456,482, March 29, 1974. This application Dec. 6, 1974, Ser. No. 530,111
Int. Cl.² H01F 1/02
U.S. Cl. 148—105 4 Claims

1. Non-pyrophoric magnetic cobalt particles of a size no larger than about 0.8 micron, said particles having sub-micron sized refractory oxide particles fixed on the surfaces thereof and containing less than 0.2 wt. % carbon and less than 2 wt % oxygen exclusive of the oxygen associated with said refractory oxide, said cobalt particles being further characterized by a coercivity of 200 to 400 oersteds and a remanent induction value of 2000–7000 gauss.

3,975,218

PROCESS FOR PRODUCTION OF III-V COMPOUND EPITAXIAL CRYSTALS

Robert A. Ruehrwein, Garden City, N.Y., assignor to Semimetals, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 248,724, April 28, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,565
Int. Cl.² H01L 7/36
U.S. Cl. 148—175 8 Claims

1. A process for the production and deposition of epitaxial layers comprised of compounds selected from the group consisting of the nitrides, phosphides, arsenides and antimonides of aluminum, gallium, indium and mixtures thereof, onto a substrate material the crystal lattice spacing of which is within about 40% of that of said compounds and being selected from the class consisting of I–VII, II–VI and III–V compounds, germanium and silicon, which comprises

A. combining in the vapor phase, while excluding oxidizing gases, first and second separate gas streams,

said first gas stream comprising an inert carrier gas and a gaseous mixture formed by the reaction in the absence of hydrogen of a Group III trihalide and a Group III element, said first gas stream being hydrogen-free; and

said second gas stream comprising an inert carrier gas and a gaseous substance selected from the group consisting of a Group V element and a volatile Group V compound; and

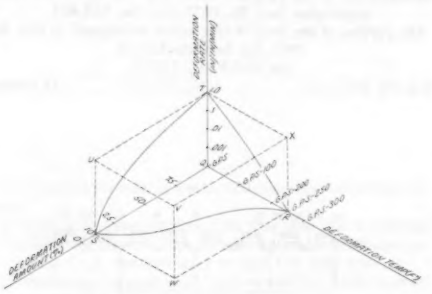
B. contacting the resulting reaction mixture with said substrate at a temperature within the range of from 135° to 1500°C. to deposit a single crystal form of at least one III–V compound as an epitaxial layer on said substrate.

3,975,219

THERMOMECHANICAL TREATMENT FOR NICKEL BASE SUPERALLOYS

Marvin Martin Allen, W. Palm Beach; John Alois Miller, Lake Park, both of Fla., and Bruce Edward Woodings, Houston, Tex., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 2, 1975, Ser. No. 609,861
Int. Cl.² C22D 1/10
U.S. Cl. 148—11.5 P 4 Claims



1. A thermomechanical process for producing a microstructure of elongated grains in nickel base superalloys, which possess a gamma prime second phase and a gamma prime solvus temperature, including the steps of:

a. providing the nickel base superalloy in a super-plastic condition;

b. hot deforming the superalloy under the following conditions: a deformation temperature below but within about 250°F of the gamma prime solvus, a deformation rate of less than about 1.0 in/in/min, and a total deformation amount in excess of about 10%;

c. progressively heating the article in a thermal gradient which moves relative to the article with the thermal gradient having a steepness of at least 50°F/in measured at the

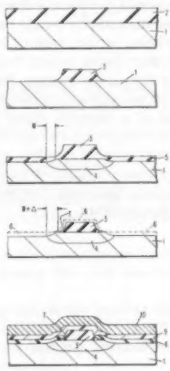
gamma prime solvus temperature, and a hot end temperature greater than the gamma prime solvus temperature but less than the melting temperature.

3,975,220

DIFFUSION CONTROL FOR CONTROLLING PARASITIC CAPACITOR EFFECTS IN SINGLE FET STRUCTURE ARRAYS

Robert Michael Quinn; William John Schuele, both of South Burlington, and Richard Alan Unis, Essex Junction, all of V.I., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,722
Int. Cl.[2] H01L 21/225, 29/78
U.S. Cl. 148—187 9 Claims



1. A method for the manufacture of semiconductor devices wherein impurity diffusions are formed into selected areas of a semiconductor substrate from an overlaying material on partial areas of said substrate and containing said impurity the improvement comprising adjusting in relation to each other the thickness of said material containing said impurity; the extent to which said selected areas formed from the completely covered substrate are etched; the thickness of material formed on the non-selected areas during the diffusion; and the depth of said diffusion in said substrate, wherein the relationship of adjusting conditions is relative pursuant to the following expression:

$$O_{VLP} = C_2 X_j - R_1 = B_2$$

Where: O_{VLP} = overlap either zero or plus or minus

$$C_2 = \frac{\text{lateral diffusion from top edge of doped oxide}}{\text{diffusion depth } (X_j)}$$

X_j = diffusion depth

$$R_1 = \sqrt{B_1^2 + T_{DO}^2}$$

with B_1 = etch bias

T_{DO} = doped oxide thickness

$$B_2 = \sqrt{R_2^2 - T_{DO}^2}$$

with $R_2 = R_1 + C_1 T_{DI}$

$$\text{and } C_1 = \frac{\text{etch rate of doped oxide}}{\text{etch rate of drive-in oxide}}$$

T_{DI} = drive-in oxide thickness

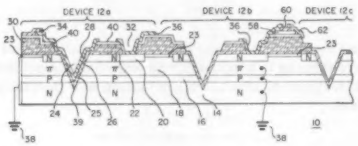
C_1 and C_2 are constants of the process

3,975,221

LOW CAPACITANCE V GROOVE MOS NOR GATE AND METHOD OF MANUFACTURE

Thurman J. Rodgers, Palo Alto, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Division of Ser. No. 392,668, Aug. 29, 1973, Pat. No. 3,924,264. This application Aug. 29, 1975, Ser. No. 608,984
Int. Cl.[2] H01L 7/34, 7/36, 7/54
U.S. Cl. 148—191 13 Claims



1. A method of making a field effect transister device, comprising the steps of:

providing a semiconductor crystal source substrate having donor and acceptor dopants in which the acceptor concentration is less than the donor dopant concentration;

forming a drift region over the source substrate having a dopant concentration less than the acceptor dopant concentration of the source substrate;

out diffusing acceptor dopant from the source substrate into the drift region to form a p-type base means;

forming n-type drain means in the drift region;

etching at least one V groove into the source substrate exposing portions of the base means and drift region;

providing insulative material over the exposed portions to form a gate oxide;

providing conductive material over the insulation material to form a gate electrode; and

providing lead means in electrical communication with the base means and drain means.

3,975,222

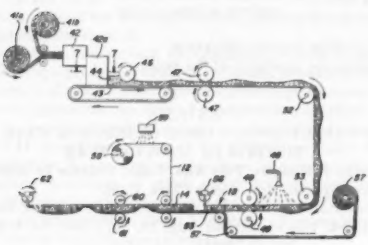
METHOD OF FORMING A FIBROUS WEB

Frederick K. Mesek, Downers Grove, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 377,351, July 9, 1973, Pat. No. 3,848,598. This application Aug. 1, 1974, Ser. No. 503,830
Int. Cl.[2] A61F 13/16
U.S. Cl. 156—62.2 10 Claims

1. The method of forming a fibrous web from which sections may be cut to form batts, said web being characterized by increasing quantities of fibers from the side edges to the central portion of the web and by alternately increasing and decreasing quantities of fibers along the length of the web, including the steps of providing at least two continuous strips of compacted short cellulose fibers, one strip being smaller in width than the other strip and located along its longitudinal median; simultaneously individualizing the fibers from each strip at a single individualizing station to produce a single stream of fibers of increasing and decreasing fiber content transversely across said stream; air laying said fibers on a

moving foraminous belt to form a web with a planar surface adjacent to said belt and a widthwise convex surface at the opposite surface; and at substantially the same time sequentially varying the rate of fiber deposition as the formed web is



carried by said foraminous belt while maintaining said convex surface thereby to produce a web with longitudinal and transverse sections of alternately increasing and decreasing fiber content.

3,975,223

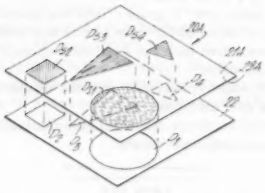
TEXTURED PAINTING AND METHOD

Allan Turoff, New York, N.Y., assignor to Erika Swimmer, New York, N.Y., a part interest

Filed Oct. 29, 1974, Ser. No. 518,472

Int. Cl.² A47G *33/08*; B29C *27/00*

U.S. Cl. 156—85 **3 Claims**



1. A method for simulating oil painting having a textured surface comprising providing a polystyrene substrate having a front surface and a rear surface of a normal configuration having a given length and width, said normal configuration having been altered with said given length and width of said substrate having been increased from 150% to 250% thereby forming a substrate of stretched configuration, applying acrylic paint smoothly to selected locations on the front surface of said stretched configuration substrate, allowing said paint to dry, heating said stretched configuration substrate including said paint thereon to within a range of from 200° to 300° Fahrenheit thereby causing said substrate length and width to shrink to said normal configuration and also causing said smoothly applied paint to form a textured surface on the front surface of said substrate, cooling said substrate and paint to within the range of 60° to 90° Fahrenheit.

3,975,224

DIMENSIONALLY STABLE, HIGH-TENACITY NON-WOVEN WEBS AND PROCESS

Ivo Ruzek; Guenther Worf; Ludwig Hartmann, all of Kaiserslautern; Paul Maahs, Bad Durkheim, and Lueder Gerking, Kaiserslautern, all of Germany, assignors to Lutravil Spinnvlies GmbH & Co., Kaiserslautern, Germany

Filed Aug. 16, 1973, Ser. No. 388,717

Claims priority, application Germany, Aug. 17, 1972, 2240437

Int. Cl.² D04H *3/16, 1/04*

U.S. Cl. 156—167 **27 Claims**

1. A process for the manufacture of dimensionally stable, high-tenacity non-woven webs using a spinning system comprising a groupwise arrangement of elongated spinnerets through which two different types of synthetic filaments are simultaneously spun in the form of rows forming bundles, wherein parallel linear bundles of

a. matrix filaments of a melt-spinnable polyester and

b. binder filaments of a melt-spinnable polymer having a melting point above 160°C but not above the temperature which is 30°C below the melting point of the matrix filaments

are spun downwardly at a throughput rate of from 3.5 to 10 g/min per spinneret hole, the ratio of the number of the binder filaments to the number of the matrix filaments being in the range of 1:1 to 1:5 and the ratio by weight between said matrix and binder filaments being in the range of 10:90 to 30:70, the bundles of filaments then being cooled below the holes and simultaneously being drawn, in groups, through a common narrow slot in a slotted aerodynamic haul-off device by means of flowing gas media at a filament speed of from 2,000 to 15,000 m/min with thermosetting and simultaneous mixing in said device as combined parallel bundles, which are then laid down below the aerodynamic haul-off device to form a random web, which is then thermally bonded in one or more stages of increasing temperature.

3,975,225

THIN, NON-POROUS POLYCARBONATE FILMS

Ludwig Bottenbruch; Gunther Kampf, both of Krefeld-Bockum; Volker Serini, and Hugo Vernaleken, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 1, 1973, Ser. No. 402,430

Claims priority, application Germany, Oct. 5, 1972, 2248818

Int. Cl.² B32B *31/04*; B29D *7/06*

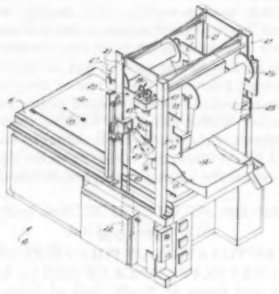
U.S. Cl. 156—242 **10 Claims**

10. A process for applying a non-porous film having thickness less than 1 μm of polycarbonates from 2,2-bis-(3,5-dimethyl-4-hydroxyphenyl) propane having molecular weights, M_w, greater than 20,000, to the surface of a porous mechanically resistant supporting layer, comprising immersing said supporting layer in a liquid that is immiscible, or sparingly miscible, with styrene spreading a solution of said polycarbonate in styrene, said solution having a concentration of at most 5g of polycarbonate per 100g of styrene, on the surface of said immiscible, or sparingly miscible, liquid; evaporating the solvent wherein the polycarbonate film is formed on the surface of the liquid in which it is substantially insoluble; and thereafter lowering the surface of the liquid below the surface of said supporting layer, whereby the polycarbonate film comes to rest, free of tension on the supporting layer.

3,975,226
APPARATUS FOR DRY PRINTING ON CONTOURED WORKPIECES

Carl E. Boettcher, Evansville, Ind., assignor to Automatic Industrial Machines, Inc., Evansville, Ind.

Filed May 12, 1975, Ser. No. 576,890
Int. Cl.² B32B *1/10*
U.S. Cl. 156—358 8 Claims



1. Dry printing apparatus for roll-on print transfer from a foil onto a contoured surface of a workpiece, comprising,

a carriage mounted for vertical movement with respect to a frame,

a roll and means for rotating it,

roll mounting means on said carriage mounting the roll for vertical movement relative to the carriage,

means for advancing a strip of dry printing foil below the roll,

means for advancing a workpiece under said foil,

spring means biasing the roll downward relative to the carriage,

carriage moving means for moving the carriage vertically relative to the frame,

sensing means for sensing vertical movement of the roll relative to the carriage,

and means actuated by the sensing means to operate the carriage moving means so that the carriage is moved vertically relative to the frame, corresponding to the vertical movement of the roll relative to the carriage, so as to restore substantially the same downward bias of said spring means on the roll.

3,975,227
PRODUCT LABELLING MACHINE

Edward Kline, Montreal, Canada, assignor to V-Mark Automation Ltd., Montreal, Canada

Filed Feb. 28, 1975, Ser. No. 554,082
Int. Cl.² B65C *3/10*, *9/42*
U.S. Cl. 156—361 5 Claims

1. A labelling assembly for applying pressure-sensitive labels to the longitudinal surfaces of cylindrical articles comprising;

label dispensing means for carrying labels to a labelling station and for dispensing the labels, one at a time, at the labelling station;

means for advancing said articles to said labelling station;

means for supporting a first article at the labelling station so that the article is free to rotate about its longitudinal axis;

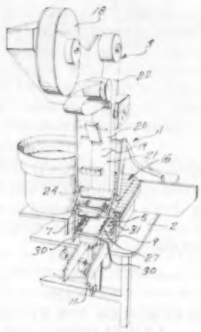
a cylindrical roller means disposed in a two position parallel arrangement with said first article wherein, in one position, said roller is spaced from said one article, and, in the second position, is in physical contact, along a longitudinal contact line, with said first article;

means for moving said cylindrical roller from the first position to the second position and from the second position to the first position;

means for rotating the roller about the longitudinal axis of the roller;

said label dispensing means being adapted to dispense a label adjacent to said contact when said roller is in said second position;

whereby, when said roller is in said second position, it will cause said article to rotate about its longitudinal axis, and the label dispensed by said dispensing means will be rolled around the longitudinal surface of the first article and will be caused to adhere to said longitudinal surface by the pressure of said roller against said first article;



first switch means adapted to be activated by said roller means when said roller means is in its second position; and

second switch means adapted to be activated by an article when said roller is in its second position and in physical contact with said article;

said first and second switch means being serially connected to advance said label dispensing means only when both said switch means are activated;

whereby a label will be activated only when said roller means is in its second position and when an article is disposed in a position for labelling.

3,975,228
DRYING METHOD AND PLANT WHICH UTILIZE FLAME JET

Yoshikazu Yasunaga, Tokyo; Zenjiro Hokao, Tokorozawa; Koji Sakusabe, Tokyo, and Yoshimitsu Tago, Kurume, all of Japan, assignors to Yasunaga Riken Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1975, Ser. No. 553,988
Claims priority, application Japan, Dec. 13, 1974, 49-143616; July 22, 1974, 49-84445
Int. Cl.² B01D *1/14*; F27D *7/00*
U.S. Cl. 159—16 A 8 Claims

1. A drying plant in which a flame jet burner is inserted into a treatment tank containing therein a matter to-be-dried, comprising:

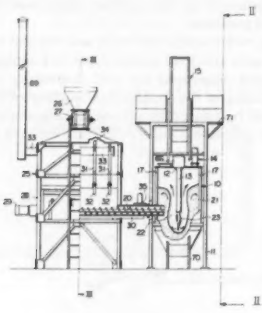
a. a feeder which continuously supplies said matter to-be-dried into said treatment tank;

b. said treatment tank being provided on one side with said feeder for said matter to-be-dried, being provided on the other side with a duct for discharging the treated matter with the drying completed, and being provided in its upper surface with an inserting port for inserting said flame jet burner;

c. a jet burner supporting device which is provided over said treatment tank, and which includes endless chain drive means to support said jet burner in a manner to freely

move it up and down and means to incline said jet burner at an ascent position thereof;

d. sound arresting means which consists of bellows provided around said jet burner and a transparent tube provided at said inserting port in said upper surface of said tank;



e. a burner ignition device which is provided at a sideward position on said upper surface of said treatment tank; and

f. a collecting device which is joined to said duct in order to collect the dried and treated matter to be discharged through said duct to the outside.

3,975,229

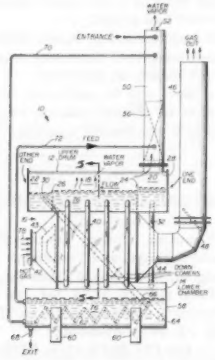
FLAMELESS REBOILER FOR RECONCENTRATING LIQUID DESICCANT

Morden A. Jackson, 1764 E. 60th Place, Tulsa, Okla. 74105

Continuation of Ser. No. 10,900, Feb. 12, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,831

Int. Cl.[2] B01D *1/00;* **F22D** *1/00;* **B01D** *53/02*

U.S. Cl. 159—31 **4 Claims**



1. A reboiler for reconcentrating liquid desiccant through utilization of exhaust gas from a prime mover comprising:

an enclosed upper reboiler drum having means to receive water-rich-desiccant, a first outlet for disengaged water vapors and a second outlet for substantially reconcentrated hot water-lean liquid desiccant, said means to receive remote from said second outlet;

an enclosed lower reboiler chamber;

a plurality of open-ended riser conduits located essentially between said means to receive and said second outlet each conduit having one end communicating with the interior of said lower reboiler chamber and having the other end protruding upwardly into said upper drum wherethrough liquid desiccant flows upwardly from said lower reboiler chamber into said upper reboiler drum;

at least one downcomer having one end communicating with the interior of said upper reboiler drum and with the other end communicating with the interior of said lower reboiler chamber to provide downward circulation of water-rich-liquid desiccant to said lower chamber as said desiccant moves to said second outlet;

a liquid level control weir positioned within said upper reboiler drum adjacent said second outlet to provide overflow of water-lean desiccant to said second outlet; and

an enclosed heating section, said heating section being disposed between said upper drum and lower reboiler chamber and enveloping said riser conduit only, said heating section having an inlet and an outlet for exhaust gas flowing from said prime mover transversely across said riser conduit, whereby liquid desiccant flowing by convection within said riser conduit from said lower chamber, to said upper drum is indirectly heated by said exhaust gas to disengage water, as vapor therefrom; said vapor eventually passing through said first outlet.

3,975,230

STEAM DISTILLATION OF POLYVINYL CHLORINE SLURRY IN PRESENCE OF METAL SALT

Kang Yang, and James D. Reedy, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 24, 1975, Ser. No. 561,404

Int. Cl.[2] B01D *1/14, 3/38;* **C08F** *1/14/02*

U.S. Cl. 159—47 R **11 Claims**

1. An improved process for removing vinyl chloride from a water-polyvinyl chloride slurry, which contains unreacted vinyl chloride, by steam distillation, wherein the improvement comprises conducting said steam distillation in the presence of an effective amount of an alkali metal sulfite or carbonate.

3,975,231

METHOD FOR PRODUCING CONCENTRATED ALUMINA SLURRIES

William C. Ziegenhain; Bruce E. Leach, and Dean O. Coleman, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 244,221, April 14, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,482

Int. Cl.[2] C01F *7/44;* **B01D** *1/00*

U.S. Cl. 159—47 R **7 Claims**

1. A method for producing free flowing concentrated alumina slurries from aqueous alumina slurries said method consisting of:

a. adding a liquid solvent to an aqueous alumina slurry to form a slurry mixture, said solvent being selected from the group consisting of ethanol, propanol, isopropanol, n-butanol, isobutanol and tertiary butanol; and

b. azeotropically evaporating solvent-aqueous vapor to produce a concentrated alumina slurry consisting essentially of from about 14 to about 17 weight percent Al_2O_3, from about 15 to about 70 weight percent water and from about 70 to about 13 weight percent solvent.

3,975,232

THREE STAGE PROCESS FOR PULPING LIGNOCELLULOSIC MATERIALS INCLUDING A CYANIDE ION CONTAINING FIRST STAGE

Robert C. Eckert, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 416,923, Nov. 19, 1973, abandoned. This application June 19, 1975, Ser. No. 588,285

Int. Cl.[2] D21C *3/02, 9/10*

U.S. Cl. 162—65 **6 Claims**

1. A process for pulping lignocellulosic material comprising;

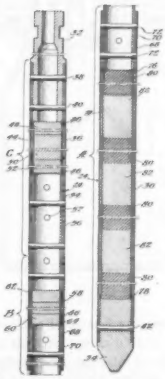
a. treating lignocellulosic material with an aqueous cyanide ion-containing solution at a temperature between room temperature and 130°C. at a pH between 7 and 12 until cyanohydrin groups are formed, withdrawing any excess cyanide ion-containing solution.
b. digesting the thus treated lignocellulosic material with an alkali metal pulping solution containing hydroxy ions at a conventional pulping temperature until a Kappa Number from 60 to 160 is obtained, and
c. treating the thus digested lignocellulosic material with 1% to 12% by weight sodium hydroxide, as sodium oxide based on the o.d. pulp from the alkaline stage, and an excess of oxygen at a partial pressure of 100 – 200 p.s.i.g. and temperature between 95°C. and 130°C. until a Kappa Number between 15 and 70 is obtained.

3,975,233

NEUTRONIC REACTOR

Charles W. J. Wende, West Chester, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 10, 1952, Ser. No. 308,768
Int. Cl.² G21C 7/10
U.S. Cl. 176—86 R **4 Claims**



1. A safety rod for a neutronic reactor comprising an elongated hollow tube, a first region approximately nine feet in length comprising a plurality of spaced layers of "masonite" disposed within the tube adjacent to one end thereof, and a layer of soft steel disposed within the tube between each pair of spaced layers of masonite, a second region adjacent to the first region comprising a sleeve disposed within the tube having a smaller outer diameter than the inner diameter of the tube forming a space between the sleeve and the tube, powdered boron disposed within said space, and a plurality of discs of polyethylene disposed within the sleeve, and a third region approximately eleven and one-half feet in length adjacent to the second region comprising a lead plug within the tube and discs of polyethylene adjacent to both sides of the plug.

3,975,234

MICROBIAL PRODUCTION OF DICARBOXYLIC ACIDS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 3, 1975, Ser. No. 593,141
Int. Cl.² C12B 1/00
U.S. Cl. 195—28 R **8 Claims**

1. A process to produce dicarboxylic acids comprising utilizing a microorganism of the mutant strains of *Torulopsis bombicola*, ηsp; PRL 319-67, Prairie Regional Laboratory, National Research Council of Canada, having been grown on a hydrocarbon-free growth medium containing at least one carbohydrate source, contacting the so grown microorganism under non-growth conditions in a non-growth converting medium being free of a nitrogen source for the microorganism with a compound selected from the group consisting of n-alkanes, n-alkyl alcohols and mixtures thereof such as to at least partially convert said compound into the corresponding dicarboxylic acid having the same number of carbon atoms as said compounds, and recovering said dicarboxylic acid from said converting medium.

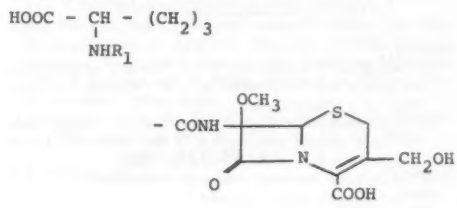
3,975,235

PROCESS FOR THE PRODUCTION OF CEPHAMYCIN TYPE ANTIBIOTIC SUBSTANCES

Tomizo Niwa, Yokohama; Hitoshi Goi, Kawasaki; Takashi Shomura, Yokohama; Yasuaki Ogawa, Yokohama; Shigeharu Inouye, Yokohama, all of Japan; Kazuo Saito, deceased, late of Fujisawa, Japan, by Nobuko Saito, heir, and Taro Niida, Yokohama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

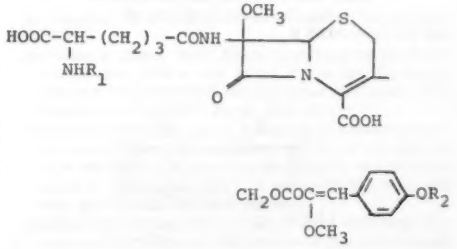
Filed Feb. 24, 1975, Ser. No. 552,282
Claims priority, application Japan, Mar. 11, 1974, 49-27261
Int. Cl.² C12D 9/00
U.S. Cl. 195—29 **6 Claims**

1. A process for the production of 7-(5-amino-5-carboxyvaleramido)-7-methoxy-3-hydroxymethyl-3-cephem-4-carboxylic acid or its N-substituted derivative represented by the following formula



(II)

wherein R_1 represents hydrogen, a lower acyl group, and an arylacyl group, a lower alkoxycarbonyl group or an arylalkoxycarbonyl group characterized in that a cephamycin type compound of the following formula:



(I)

wherein R_1 is defined as above and R_2 represents hydrogen, a sulfo group, a lowr acyl group or an arylalkoxycarbonyl group, is subjected to the action of an esterase enzyme capable of hydrolyzing an ester bond of said compound (I).

3,975,236

FERMENTATION PROCESSES FOR MAKING PENICILLIN AND CELLULASE

Murray Moo Young, Waterloo, Canada, assignor to The University of Waterloo, Waterloo, Canada

Filed Jan. 26, 1976, Ser. No. 652,301
Claims priority, application Canada, Aug. 11, 1975, 233366
Int. Cl.[2] C12D 9/08, 13/10
U.S. Cl. 195—36 P 7 Claims

1. A fermentation process, which comprises forming cellulase in an aqueous medium containing a Trichoderma species, cellulose and a small quantity of a carboxypolymethylene.

5. The process of claim 1 wherein said cellulose is provided by cattle manure.

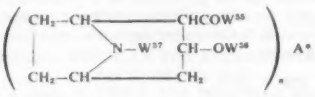
3,975,237

COMPOUNDS FOR ENZYME AMPLIFICATION ASSAY - ECGONINE ANALOGS

Kenneth E. Rubenstein, Palo Alto, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application June 20, 1974, Ser. No. 481,023
Int. Cl.[2] G01N 31/14; C07G 7/02
U.S. Cl. 195—63 10 Claims

1. An enzyme-bound-ligand of the formula:



wherein:

any one of the W groups can be —X* or an H of any of the W groups may be replaced by —X*, wherein —X* is a bond or a linking group;

A* is an enzyme bonded at other than its reactive site, having *n* ligands, wherein *n* is in the range of 1 to the molecular weight of A* divided by 2,000;

W^{55} is hydroxy, methoxy, amino or methylamino;

W^{56} is hydrogen or benzoyl; and

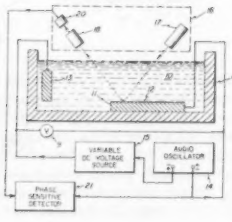
W^{57} is hydrogen or alkyl of from 1 to 3 carbon atoms.

3,975,238

METHOD AND APPARATUS FOR DETECTING MOLECULES IN SOLUTIONS

Charles P. Bean, and Ivar Giaever, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 26, 1975, Ser. No. 590,419
Int. Cl.[2] G01N 21/10, 33/16
U.S. Cl. 195—103.5 R 15 Claims



5. A method of detecting complexing of substrate molecules with surface-bound enzyme molecules in an enzymatic reaction comprising:

immersing a first electrode coated with a monomolecular layer of said enzyme molecules in a bath of said substrate molecules in solution;

immersing a second electrode in said bath spaced apart from said first electrode;

applying a sinusoidally-varying potential impressed on a D.C. potential across said first and second electrodes; and

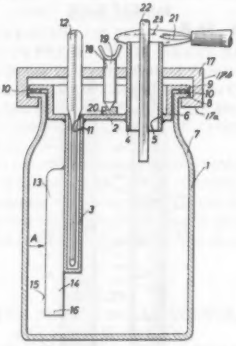
sensing changes in amount of polarized light reflected from said first electrode to provide an indication of said complexing.

3,975,239

METHOD OF AND INCUBATOR FOR PREPARING BACTERIAL CULTURES

Hans Stamer, Kurt-Schumacher-Str. 53, 314 Luneburg, Germany

Continuation-in-part of Ser. No. 192,136, Oct. 26, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 392,020
Claims priority, application Germany, Oct. 23, 1970, 2052103
Int. Cl.[2] C12B 1/00, 1/02, 1/06, 1/10
U.S. Cl. 195—108 7 Claims



1. A method of preparing bacterial culture in an incubator vessel having a tightly sealed cover with an inlet opening with a seal therein and all fixed internal parts including in combination therewith a fixed stirring member fixed to said cover, said cover and vessel being imperforate except for said opening, comprising sterilizing said vessel when tightly sealed, removing said seal and covering said opening by passing a flowing, heated gaseous sterilizing medium over said opening to prevent ingress of bacteria, placing a cannula in said opening through said medium and adding nutrient solution and removing said cannula and said heated medium and immediately, sealing said inlet opening against ingress of bacteria, cooling said vessel with said nutrient by rotating said vessel with said fixed stirring member at a variable speed in a cooling medium to produce a uniform incubation temperature, removing said seal and covering said opening by passing a flowing, heated gaseous sterilizing medium over said opening to prevent ingress of bacteria, introducing a bacterial culture through a cannula in said opening, removing said cannula and said heated medium and immediately sealing said opening against ingress of bacteria and maintaining said vessel and contents at incubation temperature until incubation is complete, and cooling said vessel and contents to a temperature which prevents further growth of bacteria and is suitable for storage of the culture by rotating said vessel with said fixed stirring member in a cooling medium at a variable speed to produce uniform cooling to the storage temperature.

3. An apparatus for stirring bacterial cultures comprising a vessel having an open top and a cover sealing said open top, said vessel being tightly sealed and imperforate except for an

opening through said top which is sealed against ingress of bacteria, a fixed stirring member fixed to said cover and extending into said vessel, a rotating disk in a cooling fluid upon which said vessel is mounted, and means for rotating said disk at a variable speed to accelerate and decelerate said vessel, so that said fixed stirring member stirs said liquid in said vessel, and flame producing means to cover said opening with a flame and form a barrier to the ingress of bacteria when the opening is not sealed.

3,975,240

PROCESS AND SYSTEM FOR DETERMINING THE END OF A COKING PROCESS

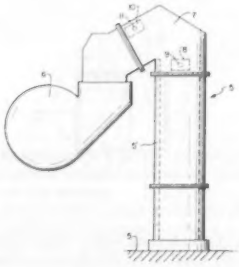
Horst Seeberg, and Horst Fach, both of Essen, Germany, assignors to Didier Engineering GmbH, Essen, Germany

Filed Jan. 7, 1976, Ser. No. 647,171

Claims priority, application Germany, Jan. 14, 1975, 2501199

Int. Cl.² C10B *47/00*; G01K *3/08*

U.S. Cl. 201—1 **11 Claims**



1. A system for determining the end of a coking process in a coke oven of the type wherein fill gases formed during the coking process are removed from oven chambers of the coke oven through risers, said system comprising:

separate temperature measuring means, positioned on the riser of at least one oven chamber at locations thereon whereat the temperatures are different during the production of coke but whereat said temperatures are equal at the completion of the coking process, for detecting said temperatures and generating signals representative thereof and for providing an indication of the completion of the coking process when the difference between said signals lessens.

3,975,241

DISTILLATION APPARATUS

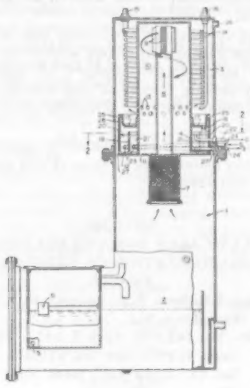
Verity C. Smith, Dedham, Mass., assignor to Vaponics, Inc., Plymouth, Mass.

Filed July 23, 1970, Ser. No. 57,435

Int. Cl.² B01D *3/00*

U.S. Cl. 202—202 **2 Claims**

1. In a distillation apparatus which includes a vented housing enclosing a still and a condenser, the improvement comprising a reboiler within said housing arranged for collecting condensate from said condenser, said reboiler comprising means defining a long horizontal channel having an inlet for condensate at one end and an outlet at another end thereby providing means for channeling said condensate in a horizontal path from said inlet to said outlet, and means within said channel for heating the condensate therein.



3,975,242

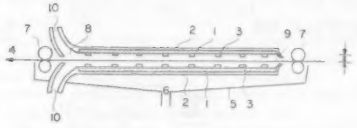
HORIZONTAL RECTILINEAR TYPE METAL-ELECTROPLATING METHOD

Shozo Matsuda, Tokyo; Tadashi Tanaka, Yokohama; Joji Oka, Kawasaki; Saburo Ayusawa; Kiyotoshi Iwasaki, both of Kisarazu; Toshiyuki Teramachi, and Toshitake Miyazono, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 310,079, Nov. 28, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,089

Int. Cl.² C25D *7/00*, *7/06*

U.S. Cl. 208—28 **3 Claims**



1. A method for plating a steel strip, said method comprising:

providing a plating vessel having a rectangular cross-section, a strip inlet, a strip outlet and an interior having opposed horizontal and parallel upper and lower walls formed of an insoluble anode material;

providing interference plates formed of an insulating material on each said upper and lower walls in an arrangement such that all of said plates extend obliquely in a direction inwardly from lateral edges of said walls and from said strip inlet toward said strip outlet;

continuously passing a horizontally aligned steel strip, as a cathode, in a horizontal and rectilinear direction through said strip inlet, through said vessel interior between said upper and lower walls, and outwardly through said strip outlet;

continuously circulating substantially all of a plating solution within said plating vessel entirely in a direction counter to the direction of movement of said steel strip, while maintaining the flow velocity of said plating solution such that

$X \geqq 0.25\ y/z$ on the upper surface of said steel strip and $X \geqq 5y + 4$ on the lower surface of said steel strip,

wherein X is flow velocity of said plating solution in m/min., y is the length of said walls of anode material in m, and z is the distance between either of said walls of anode material and said strip in m;

said step of continuously circulating said plating solution comprising passing said plating solution at least partially between longitudinally adjacent of said interference plates in oblique directions and thereby flowing said plating solution uniformly across the entire width of said strip; and

operating said walls of insoluble anode material as anodes and thereby plating both surfaces of said strip as it passes through said vessel.

3,975,243

ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING DIAZOTIZATION OF PRIMARY AROMATIC AMINES

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Division of Ser. No. 242,141, April 7, 1972. This application Sept. 4, 1975, Ser. No. 610,476

Int. Cl.² C25B *3/00*; **B44C** *1/04*

U.S. Cl. 204—72 **2 Claims**

1. An electrolytically polymerizable composition comprising:

a. a polymerizable ethylenically unsaturated compound; and

b. a polymerization catalyst precursor comprising a combination of:

1. an alkali metal nitrite and

2. a compound selected from the group consisting of diazotizable primary aromatic amines and compounds capable of yielding said amines upon electrolysis.

3,975,244

ELECTROLYTIC REFINING

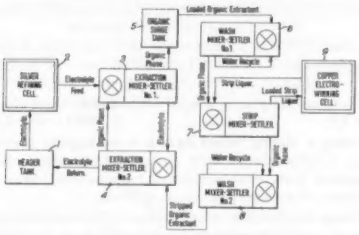
William Hunter, St. Albans, England, assignor to Brookside Metal Company Limited, London, England

Filed Sept. 10, 1975, Ser. No. 612,229

Claims priority application United Kingdom, Sept. 23, 1974, 41336/74

Int. Cl.² C25C *1/12*, *1/20*

U.S. Cl. 204—108 **14 Claims**



1. A method of electrolytically refining silver that contains copper as a significant impurity comprising passing electric current through an electrolyte containing silver ions and cupric ions between an anode of said silver and a cathode both immersed in said electrolyte in an electrolytic refining cell, removing electrolyte from said cell, and contacting said electrolyte outside said cell with a separate immiscible liquid phase comprising a selective complexing agent for said cupric ions until its copper content is at least substantially reduced, to make it suitable for reuse in silver refining.

3,975,245

ELECTROLYTE FOR ELECTROCHEMICAL MACHINING OF NICKEL BASE SUPERALLOYS

Everett John Bergquist, Glastonbury, and Lawrence Joseph Jennings, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 5, 1975, Ser. No. 638,209

Int. Cl.² C25F *3/02*

U.S. Cl. 204—129.95 **5 Claims**

1. An electrolyte for electrochemical machining comprising an aqueous solution containing from about 10 to about 300 ml/gal nitric acid, from about 40 to about 150 ml/gal hydrochloric acid, and from about 0.5 to about 3 lbs/gal of citric acid.

3,975,246

METHOD OF DISINFECTING WATER

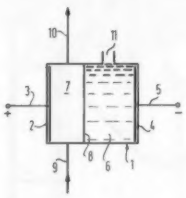
Volker Eibl, and August Reis, both of Munich, Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt am Main, Germany

Continuation-in-part of Ser. No. 473,376, May 28, 1974, abandoned. This application Aug. 12, 1975, Ser. No. 604,038

Claims priority, application Germany, June 9, 1973, 2329629

Int. Cl.² C02B *1/82*

U.S. Cl. 204—151 **10 Claims**



1. A method of disinfecting water which comprises:

a. supplying the water to be disinfected to the anode compartment of an electrolytic cell, the cell being divided into said anode compartment and a cathode compartment by a membrane permeable to anions and having an anode and a cathode in said compartments respectively;

b. maintaining in said cathode compartment an aqueous solution of a member of the group consisting of the chloride, hydroxide, carbonate, and peroxide of an alkali metal, hydrogen chloride, and hydrogen peroxide;

c. passing direct current between said anode and said cathode through said cell; and

d. withdrawing disinfected water from said anode compartment,

1. the concentration of said member in said aqueous solution being greater than the concentration thereof in the water in said anode compartment and sufficient to enhance the disinfecting effect of said current on said water in the anode compartment as compared to the disinfecting effect of said current on said water in the anode compartment when said cathode compartment is filled with said water.

3,975,247

TREATING SEWAGE AND RECOVERING USABLE WATER AND SOLIDS

Bernard J. Stralser, E. 12726 Apache Pass, Spokane, Wash. 99206

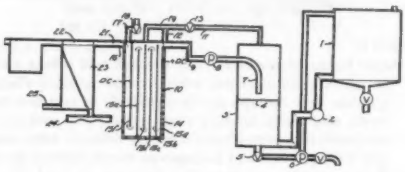
Filed Jan. 23, 1974, Ser. No. 435,655

Int. Cl.² C25B *1/26*; **C02B** *1/82*

U.S. Cl. 204—152 **6 Claims**

1. A method of treating sewage and recovering reusable water and solids substantially free of live bacteria which comprises:

a. diluting the sewage with water to greater than 20 parts water to one part solids by weight;
b. macerating the diluted material to reduce the solids therein to free any contained hard solids heavier than water and to break up the other solids to an extent that they are carried in suspension;
c. passing the diluted macerated sewage upwardly through a screen thereby separating the non-suspended solids from the liquid that have not been reduced in size by maceration,
d. adjusting the chloride salt content of the sewage to between a minimum of 0.05% and a maximum of 3.5% by weight;



e. passing the screened sewage in a serpentine path progressively between a series of parallel electrodes that are not attacked by the sewage;
f. applying an electrical voltage across end electrodes of the series of sufficient magnitude to create a varying voltage potential between adjacent intermediate electrodes so that each intermediate electrode serves as a cathode with respect to one adjacent electrode and as an anode with respect to the other adjacent electrode and so that the electrical current flow between adjacent electrodes through the sewage is between 0.25 and 1.0 amps per square inch of electrode surface;
g. removing evolved gases as the sewage progressively passes between the electrodes; and
h. separating the liquid and suspended solids after the sewage passes between the electrodes.

3,975,248

MOLECULAR COMPOSITE STRUCTURES

Lee V. Gorman, Dallas, Tex., assignor to Chemprobe Corporation, Garland, Tex.

Continuation-in-part of Ser. No. 365,478, May 31, 1973, abandoned. This application Sept. 12, 1974, Ser. No. 505,238

Int. Cl.² B01J *1/12*

U.S. Cl. 204—157.1 S **30 Claims**

1. The process comprising admixing a compound selected from a first group which consists of compounds having a tetravalent element and oxygen in the molecular nucleus and free appendant groups selected from hydrogen, hydroxy, amino, halogen, and oxygen, with a diffusant selected from the normally solid elements in Groups IIIA and VA and germanium, tin and titanium in Group IV of the Periodic Table and subjecting the resulting mixture to a pressure above about 500 pounds per square inch and an excitation energy having a frequency above about 10 kilocycles per second to thereby couple said compound and said diffusant.

3,975,249

AROMATIC POLYMERS OF INCREASED RESISTANCE TO FLOW AND MOLECULAR WEIGHT OBTAINED BY IRRADIATION

Philip Anthony Staniland, Welwyn, and Graham Jarrett, Hitchin, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 381,382, July 23, 1973, which is a continuation-in-part of Ser. No. 207,948, Dec. 14, 1971, abandoned. This application Apr. 16, 1974, Ser. No. 461,407

Claims priority, application United Kingdom, Dec. 22, 1970, 60906/70; Apr. 16, 1973, 18187/73

Int. Cl.² C08F *8/00*

U.S. Cl. 204—159.14 **16 Claims**

1. An aromatic polymer having increased molecular weight and resistance to flow produced by the exposure to a total dose of 10 to 150 Mrads of β-ray ionizing radiation at a temperature of 100°C to 400°C of at least one aromatic polysulphone containing repeat units $-Ar-SO_2-$ (where Ar is a bivalent aromatic residue which may vary from unit to unit in the polymer chain and at least some of the Ar units have an aromatic ether or thioether group in the polymer chain ortho or para to at least one $-SO_2-$ group).

3,975,250

ELECTRODEPOSITION WITH REACTIVE MODIFIER FOR AMINE GROUP-CONTAINING, ACID-SOLUBILIZED RESINS

Joseph R. Marchetti, Greensburg, and Robert D. Jerabek, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 430,325, Jan. 2, 1974, abandoned, which is a division of Ser. No. 248,753, April 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 193,591, Oct. 28, 1971, abandoned. This application Feb. 5, 1975, Ser. No. 547,326

Int. Cl.² C25D *13/06, 13/10*

U.S. Cl. 204—181 **8 Claims**

1. A method of electrocoating an electrically-conductive surface serving as a cathode in an electrical circuit comprising said cathode, an anode and an aqueous electrodepositable composition, which electrodepositable composition comprises:
A. an acid-solubilized polyamine group containing resin;
B. an adduct containing a plurality of capped isocyanate groups, stable at ordinary room temperature but reactive with said polyamine resin at elevated temperatures, said adduct having been formed by the reaction of:
1. a diamine containing an acrylic chain of greater than 5 members between its amine groups and
2. a semi-capped organic polyisocyanate containing an average of about one free isocyanate group.

3,975,251

CATHODIC ELECTROCOATING PROCESS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 560,108

Int. Cl.² C25D *13/10, 13/06*

U.S. Cl. 204—181 **2 Claims**

1. In a process for electrodeposition of a heat-curable electrocoating composition containing a polymer having pendant amine groups and a cross-linking agent in an aqueous dispersion onto a cathode substrate disposed within an aqueous electrocoating bath, said polymer being cross-linkable upon subsequent heating of said electrocoated cathode substrate, the improvement comprising:
a. providing said electrocoating composition containing
i. a polymer having at least about 5% by weight pendant primary or secondary amine groups, said amine groups being protonated with acid to render said polymer water dispersible in said bath; and

ii. at least about 5% by weight of said polymer of alpha-, beta-ethylenically unsaturated carbonyl cross-linking agent having at least two alpha-, beta-ethylenically unsaturated carbonyl groups;

b. applying an electromotive potential through said bath to electrodeposit said polymer and said cross-linking agent onto said cathode substrate, whereby said pendant amine groups of said polymer become de-protonated; and

c. heating said electrocoated cathode substrate to cross-link said polymer by addition polymerization of said cross-linking agent with said de-protonated pendant amine groups to form a heat-cured electrodeposited coating.

3,975,252

HIGH-RESOLUTION SPUTTER ETCHING

David Bruce Fraser, Berkeley Heights, and David Yuan Kong Lou, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1975, Ser. No. 558,489
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 **20 Claims**

FORM MULTILAYER STRUCTURE
FORM PATTERN IN RESIST LAYER 12
FORM PATTERN IN LAYER 16 BY REACTIVE SPUTTER ETCHING IN HALOCARBON ATMOSPHERE
FORM PATTERN IN LAYERS 14, 18 BY REACTIVE SPUTTER ETCHING IN OXIDIZING ATMOSPHERE
REMOVE PORTIONS 27, 29, 25 AND FORM PATTERN IN LAYER 20 BY REACTIVE SPUTTER ETCHING IN HALOCARBON ATMOSPHERE. REMOVE RESIDUES BY CHEMICAL ETCHING

1. A method adapted for patterning a layer on which is disposed an intermediate masking layer, said intermediate masking layer having disposed thereon a pattern of resist material that exposes selected surface portions of said intermediate masking layer, said method comprising the step of

sputter etching said intermediate masking layer in a halocarbon atmosphere to form in said intermediate layer a pattern corresponding to that defined by said resist material,

said method comprising the additional step of

sputter etching said layer to be patterned through said intermediate mask to form in said layer to be patterned a pattern corresponding to that defined by said resist material,

wherein said second-mentioned sputter-etching step is carried out in an oxidizing atmosphere.

3,975,253

PROCESS CHANGE SENSOR

Frederick J. Radd; Louis H. Wolfe, and Donald H. Oertle, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 26, 1975, Ser. No. 562,281
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 R **5 Claims**

1. A process change sensor comprising:

an elongated tubing means;

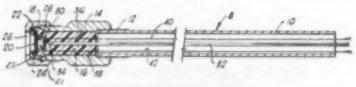
open-ended housing means having one end of said tube connected to one open end thereof;

a first permeable electrode positioned in one end portion of the housing means for contacting a process medium;

a second permeable electrode positioned inwardly in the housing means from said first electrode;

electrically non-conductive fixture means positioned in said housing means and holding said electrodes in spaced relation to each other in an electrically insulated position relative to said housing means and said tubing means;

a porous body separating said first electrode from said second electrode;



means for supplying electrolyte through said tubing means to said second electrode whereby said supplied electrolyte can flow through said porous body to said first electrode, said means for supplying electrolyte to said second electrode comprising an electrolyte delivery tube within said tubing means and passageway means defined by said fixture means and extending between an end of said electrolyte delivery tube and said second electrode; and

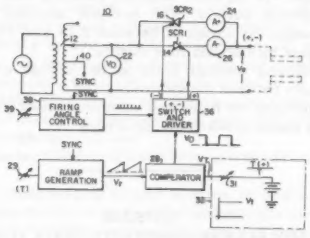
means for measuring the change in EMF between said first and second electrodes as a result of changes in the process medium at said first electrode.

3,975,254

FORWARD-REVERSE PULSE CYCLING ANODIZING AND ELECTROPLATING PROCESS POWER SUPPLY

Richard A. Elco, Pittsburgh; James A. Bauer, Murrysville, both of Pa., and Willard E. Treese, Walnut Creek, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1974, Ser. No. 497,174
Int. Cl.² C25D *5/18, 11/02*
U.S. Cl. 204—228 **8 Claims**



1. An electroplating process power supply for supplying power from an alternating current supply to an electroplating load comprising:

a positive output unidirectional triggerable device disposed between the alternating current supply and the electroplating load;

a negative output unidirectional triggerable device disposed between the alternating current supply and the electroplating load;

cycle time selecting means connected to said positive output unidirectional device and said negative output unidirectional device for selecting a cycle time, independent of current flow through said unidirectional devices, during which a first series of discrete positive current pulses followed by a second series of discrete negative current pulses are supplied to the electroplating load;

ratio control means connected to said cycle time selecting means for selecting the time when the first series of discrete positive pulses ceases and the second series of discrete negative pulses start, thereby controlling the ratio of the positive current pulse supplied to the negative current supplied; and,

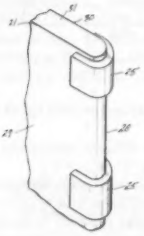
firing angle control circuit means connected to said positive output unidirectional device or said negative output unidirectional device for selecting the width of each of the first series of pulses and the second series of pulses supplied to the electroplating load.

3,975,255

INTER-ELECTRODE SPACING IN DIAPHRAGM CELLS

Morton S. Kircher, Oakville, Canada, assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 27, 1974, Ser. No. 446,186
Int. Cl.² C25B 1/26, 9/00, 9/02, 13/00
U.S. Cl. 204—252 8 Claims



1. A diaphragm cell for electrolyzing an electrolyte comprised of;

1. a horizontal container having opposite and substantially parallel ends, said container having a first opening at one end and a second opening at the opposite end;
2. a cathode wall removably secured to said container and covering said first opening;
3. an anode wall removably secured to said container and covering said second opening;
4. a plurality of cathodes attached to said cathode wall, said cathodes being positioned parallel to and separated from each other and projecting across said cell towards said anode wall;
5. a diaphragm attached to said cathodes;
6. a plurality of anodes attached to said anode wall, said anodes being positioned parallel to and separated from each other and projecting across said cell towards said cathode wall wherein the edge of each anode closest to the cathode wall is defined as the leading edge, said anodes being positioned adjacent to and apart from said cathodes;
7. at least one non-conductive spacer fixedly attaced to the leading edge and a portion of each side of each of said anodes so as to remain in position to space said anodes apart from said cathodes a predetermined distance while cell is in operation, wherein said leading edge is the edge closest to said cathode wall.

3,975,256

APPARATUS FOR TREATMENT OF AQUEOUS SEWAGE COMPOSITION

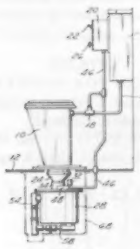
Theodore C. Johnson, Solon, Ohio, and James D. Snodgrass, Darien, Ill., assignors to Heds, Inc., Chagrin Falls, Ohio

Filed Feb. 22, 1973, Ser. No. 334,761
Int. Cl.² C02B 1/82
U.S. Cl. 204—275 8 Claims

1. Apparatus capable of waste-treating operation, without waste-agitating, waste-spreading, waste-stirring, waste-shaking, waste-distributing, waste-separating, waste-propelling, waste-mixing, waste-conveying, or other waste-manipulating mechanical moving parts, for sterilizing, disintegrating, and discharging an aqueous sewage composition comprising:

a. an enclosed chamber having top, bottom, and sidewall members for receiving aqueous sewage composition in its lower portions to thereby define an ullage space in its upper portions, the chamber being empty of mechanical moving parts for waste treatment,

b. a substantially gas-tight valved inlet for the aqueous sewage composition opening into the top of the ullage space,



c. at least two electrodes of unlike polarity extending into a treatment space at the lower sewage-receiving portions of the chamber below the ullage space,

d. power-receiving and control means for imposing on the electrodes a potential difference sufficient to effect electrolytic discharge of gas at at least one of the electrodes and a current across said electrodes sufficient to cause ebullient roiling action in said composition, to thereby generate a solids-containing evolved head of lesser density above the aqueous sewage composition,

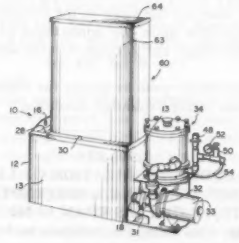
e. an outlet opening from the top of the ullage space and connecting through conduit means to a discharge end, said outlet being open to passage of said solids-containing evolved head from said ullage space.

3,975,257

APPARATUS FOR REMOVING PARTICLES AND CHEMICALS FROM A FLUID SOLUTION

Murlin L. Hulse, R.R. 1 - M62, Cassopolis, Mich. 49031

Filed Feb. 25, 1974, Ser. No. 445,222
Int. Cl.² C25B 7/00; C25D 15/02
U.S. Cl. 204—299 R 14 Claims



1. An apparatus for removing metal, fibers and other particles from a fluid solution, normally produced during a manufacturing operation involving the rinsing of such particles and etchants from the manufactured article, including recycling tank means for receiving and containing a volume of said fluid solution, said recycling tank means having a bottom wall, side walls, an inlet to allow said fluid solution to flow thereinto, and

an outlet through which said fluid solution may be discharged, a substantial portion of at least said side walls of said recycling tank means being formed of plastic electret material capable of retaining a static electrical charge on its surfaces to thereby cause said metal, fibers and other particles contained in said fluid solution flowing therethrough to adhere to and be retained on said side walls and effectively removed from said fluid solution, filter means, in communication through suitable conduit means with said outlet of recycling tank means, for removing particulate matter from said fluid solution, said filter means having a housing, a plurality of filter cartridges mounted within said housing, said cartridges acting to remove additional particles from said solution, such that said solution may be discharged from said filter means in a condition suitable for reuse in the manufacturing operation.

3,975,258

SAFETY SEAT BELTS FOR VEHICLE OCCUPANTS

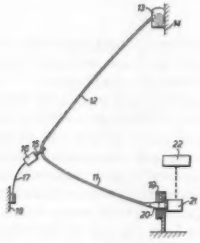
John William Fox, Ashtead, England, assignor to P.C.S. Developments Limited, London, England

Filed July 9, 1974, Ser. No. 486,880

Claims priority, application United Kingdom, July 9, 1973, 32608/73

Int. Cl.² B60R *21/08*

U.S. Cl. 280—733 **8 Claims**



1. A safety seat belt for protecting the occupant of a vehicle upon the occurrence of an accident, comprising

a. a flexible tubular impervious seat belt member adapted for connection with the vehicle to extend across at least one of the lap and chest portions of the occupant, at least a portion of said seat belt member being generally radially expansible and collapsible between collapsed and expanded conditions, respectively, said seat belt member in the collapsed condition having a generally flat cross-sectional configuration;

b. means establishing a vacuum in said seat belt portion to normally maintain the same in the collapsed condition;

c. means operable upon the application of impact to the vehicle to release the vacuum in said seat belt portion; and

d. means including resilient means for expanding the seat belt portion to the expanded condition.

3,975,259

HYDRODESULFURIZATION OF LIQUID HYDROCARBON UTILIZING A SUSPENDED CATALYST PARTICLE OF LESS THAN 10 MICRONS

Louis C. Doelp, Glen Mills, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed July 10, 1975, Ser. No. 594,883

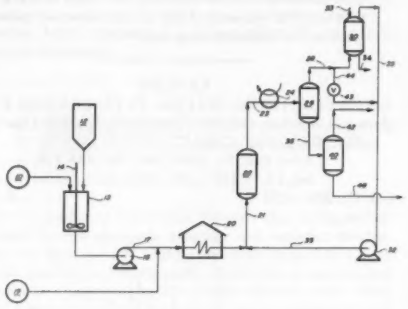
Int. Cl.² C10G *23/02*

U.S. Cl. 208—213 **10 Claims**

1. A hydrodesulfurization process which comprises the following steps:

a. suspending a hydroconversion catalyst having a nominal particle size of less than 10 microns in a liquid hydrocarbon feedstock, said catalyst being selected from the group consisting of the metal, metal oxide and metal sulfide of nickel, cobalt, molybdenum, tungsten and mixtures thereof, supported on alumina, silica, magnesia, aluminosilicate zeolite and mixtures thereof,

b. feeding the resulting suspension together with a hydrogen-rich gas through a contact zone at an elevated temperature and pressure and at a weight hourly space velocity of between 200 and 50,000 kg. of oil per kg. of catalyst per hour,



c. withdrawing the effluent containing said catalyst therein from said contact zone,

d. separating the normally gaseous materials from the liquid portion of said effluent, and

e. recovering a liquid product from said liquid portion of step (d) having substantially reduced sulfur content.

3,975,260

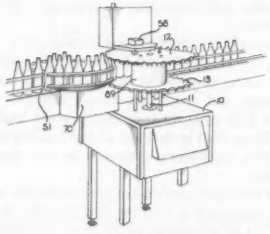
BOTTLE HANDLING APPARATUS

John J. Peyton, and James H. Wyman, both of Santa Barbara, Calif., assignors to Industrial Automation Corporation, Santa Barbara, Calif.

Continuation of Ser. No. 305,708, Nov. 13, 1972, abandoned. This application Oct. 23, 1973, Ser. No. 408,921

Int. Cl.² B07C *5/342*

U.S. Cl. 209—73 **38 Claims**



1. Container conveying apparatus which comprises:

a. a pair of spaced substantially circular rotatable discs, said discs each having a plurality of recesses on the periphery thereof, said recesses in each of said discs being aligned whereby containers may be held in said recesses;

b. a plurality of clamps aligned with said recesses whereby containers may be secured in said recesses, each said clamp comprising,

i. a pair of spaced elongate members, said members being pivoted intermediate the ends thereof, said members extending substantially radially of said discs,

ii. a toggle joint joining the inboard ends of said spaced members whereby straightening of said toggle joint will

cause the outboard ends of said members to approach each other so as to hold a container therebetween,

iii. means for limiting the motion of said toggle joint, said limit in one direction allowing said clamp to be in an open condition and said limit in the opposite direction being slightly over center of said toggle whereby said clamp is in closed position, and

iv. a tension spring joining the inboard portions of said spaced members whereby said clamp will have two stable positions,

c. means for causing each of said clamps to close upon said clamp passing a first predetermined position; and

d. means for causing each of said clamps to open upon said clamp passing a second predetermined position whereby a container held in said recess will be delivered at a first output position.

3,975,261

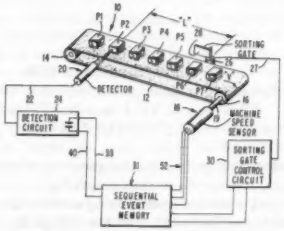
SEQUENTIAL EVENT MEMORY CIRCUIT FOR PROCESS AND QUALITY CONTROL

Kenneth H. Beck, Newtown, Pa., assignor to Tac Technical Instrument Corporation, Trenton, N.J.

Continuation-in-part of Ser. No. 429,861, Jan. 2, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,678

Int. Cl.² B07C *9/00*

U.S. Cl. 209—74 M **21 Claims**



1. A system primarily for association with a means for detecting a predetermined characteristic in material being transported by a conveyor, for delaying a pattern of information from the detector, and for repeating that pattern of information at the time when material of the indicated characteristic is at a suitable downstream location on the conveyor to be acted upon by a control device operating in accordance with the delayed information, comprising:

a. a shift register activated by a signal input from the detecting means, said shift register when so activated being adapted for movement of a given input signal pattern therethrough as a function of time at a rate determined by clock pulses separately input to the shift register;

b. a source of synchronizing signals; and

c. adjustable decade scaler means interposed between the shift register and said source adapted for input of said clock pulses to the shift register at a rate selectable by user and having a predetermined ratio to said synchronizing signals.

3,975,262

SYNCHRONIZED PRODUCE SORTING SYSTEM

John R. Sherwood, Arlington, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,594

Int. Cl.² B07C *5/10*

U.S. Cl. 209—111.6 **9 Claims**

1. In a produce grading and sorting system

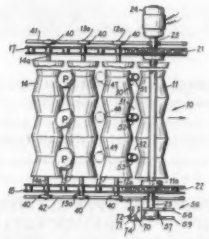
detector means for receiving radiation from desired articles of produce and from undesired objects in a given field of view of the detector means and for producing a plurality of electrical signals whose magnitudes correspond to respective predetermined components of the received radiation,

conveyor means having uniformly spaced produce receiving means thereon for continuously moving a row of uniformly spaced articles of produce into and through said field of view,

means for producing a first signal when a desired article or an undesired object is in said field of view,

means responsive to said electrical signals for producing a second signal only when a desired article is in said field of view,

means synchronized with the movement of said conveyor means for producing gating pulses when a produce receiving means of the conveyor means is substantially centered in said field of view,



means synchronized with the movement of the conveyor for generating trigger pulses which occur at times substantially midway between the occurrence of adjacent gating pulses,

means responsive to the occurrence of both a first signal and a gating pulse for producing a set pulse,

means for coupling said second signal to said means for producing a set pulse to prevent the producing of a set pulse upon occurrence of a second signal,

bistable means responsive to set pulses and to each trigger pulse occurring next after the beginning of a set pulse for transferring said bistable means to its second state,

means responsive to the transfer of the bistable means to its second state and operable in synchronism with said conveyor for producing an eject pulse when a previously upstream produce receiving means on the conveyor is in said field of view and when a detected undesired object is at a given downstream position from said field of view.

3,975,263

MATERIAL SEPARATION APPARATUS AND METHOD

Heikki K. Elo, P.O. Box 799 - Uhler Road, Easton, Pa. 18042

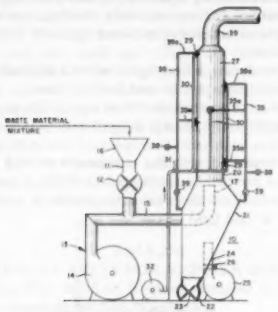
Filed Feb. 25, 1975, Ser. No. 552,943

Int. Cl.² B07B *7/01*

U.S. Cl. 209—138 **10 Claims**

1. A separation unit for the aerodynamic separation of a mixture of materials into at least two fractions comprising a vertically disposed separation column having substantially the same diameter throughout its vertical length, first inlet means secured to said separation column adjacent the lower end thereof for feeding a pneumatically fluidized mixture of materials into said column for upward passage therethrough, second inlet means secured to said separation column at a point below said first inlet means for passing secondary air upwardly into said column for admixture with the pneumatically fluidized air mixture, a plurality of air jet means secured in vertically spaced relationship to the upper portion of said separation column for feeding jets of high pressure air into said column at vertically spaced points to establish a plurality of vertical zones of turbulence with said pneumatically fluidized mixture of materials during its upward movement through said column, bottom discharge means secured to the bottom of

said separation column for receiving and discharging the heavier particles of the pneumatically fluidized mixture of materials which have dropped from said mixture of materials



during its upward passage through said column and upper discharge means secured to the upper end of the column for receiving and carrying off the mixture of air and the lighter particles of said mixture of materials from said column.

3,975,264

FLOTATION OF COPPER SULFIDE ORES WITH IMPROVED THIONOCARBAMATES

Franklin Anderson Bolth, Baltimore, Md.; Ronald David Crozier, Bedford, N.Y., and Lawrence Evans Strow, Baltimore, Md., assignors to Minerec Corporation, New York, N.Y.

Division of Ser. No. 379,114, July 13, 1973, Pat. No. 3,907,854. This application June 26, 1974, Ser. No. 483,128

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **2 Claims**

1. A process for the concentration of sulfide ores by flotation comprising:

comminuting said ore so as to render same amenable to flotation;

subjecting said ore to flotation conditions in the presence of a collector, said collector comprising an alkyl isopropyl thionocarbamate of at least 98% purity, and less than 2% isopropyl alcohol;

said collector being the organic reaction product of an aqueous solution of an alkali metal isopropyl xanthate and a lower alkyl amine carried out in the presence of a dissolved catalyst selected from the group consisting of nickel and palladium ions.

3,975,265

FROTH FLOTATION METHOD FOR THE RECOVERY OF MINERALS BY MEANS OF TERNARY SULFONIUM NITRITES AND TERNARY STIBINE DINITRITES

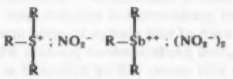
Vojislav Petrovich, 1925 W. Schiller St., Chicago, Ill. 60622

Continuation of Ser. No. 500,006, Aug. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 423,434, Dec. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 285,883, Sept. 12, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 570,521

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **11 Claims**

1. A method of beneficiating ores selected from the group of oxide, silicate, sulfide, arsenide, and antimonide of copper, nickel, and cobalt, and minerals selected from the group consisting of lithium, sodium, potassium, and caesium silicates, halides and sulfates, barium, and strontium sulfates, and carbonates by froth flotation process to produce a froth concentrate of desired metal values which comprises; effecting froth flotation of said ores and minerals in the presence of nitrous acid and collectors consisting of a combination of ternary sulfonium nitrite and ternary stibine dinitrite, or a combination of two different ternary sulfonium nitrites, or a combination of two different ternary stibine dinitrites, or a combination of ternary sulfonium nitrite and either potassium, sodium, and ammonium nitrites, or calcium, strontium, barium, and iron dinitrites, or a combination of ternary stibine dinitrite and either potassium, sodium, and ammonium nitrites, or calcium, strontium, barium, and iron dinitrites, said compounds in conjunction with nitrous acid forming at the minerals surface of said metals mineral-hydrocarbon complexes; both components of said complexes have the formulas



in which R may be of the same constitution or to be of different constitution, R is selected from the group consisting of alkyl, alkanol, alkyldiol, or alkytriol, said R's containing 1–8 carbon atoms, the number of hydroxyl groups furnished by the combination of said collectors being 0 to 3, the number of said hydroxyl groups in said mineral hydrocarbon complexes being 1 to 3, the sulfonium nitrites of shorter chain R's having zero hydroxyl groups, the stibine dinitrites of longer chain R's having 1–3 hydroxyl groups, said complexes attaching to bubbles provided by agitating the pulp of mineral slurry; and recovering a froth concentrate relatively rich in the desired metal value leaving tailings relatively poor in desired metal value.

3,975,266

DEWATERING PROCESS

Sylvia S. Baize, 1433 Shankin, Walled Lake, Mich. 48088

Filed Nov. 6, 1974, Ser. No. 521,344

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—10 **4 Claims**

1. In a dredging process for the recovery of activated sludge from water, the improvement comprising:

a. dredging a mass of water having solids suspended therein,

b. admixing a flocculant with the dredge by:

1. dissolving the flocculant in water to form a solution thereof,
2. transferring the solution to a holding tank, and
3. metering the solution to the dredge from the holding tank,

c. thickening the suspended matter in the water,

d. dewatering the thickened matter,

e. adding chlorine to the dewatered thickened matter,

f. recovering the thickened matter from the dewatering step, and wherein the flocculant is selected from the group consisting of ferric sulfate, ferrous sulfate, calcium hydroxide, diatomaceous earth, bentonite, alum, anionic polymers, cationic polymers and mixtures thereof, the flocculant being employed in an amount ranging from about 0.5 to 200 ppm, by weight, per million parts by weight of dredged water.

3,975,267

LIQUID TREATING SYSTEM

Henry H. Wendel, Mexico City, Mexico, assignor to Henry H. Wendel, Mexico City, Mexico

Continuation of Ser. No. 448,542, March 6, 1974, abandoned. This application July 18, 1975, Ser. No. 597,017

Int. Cl.[2] C02B *1/76*

U.S. Cl. 210—35 **13 Claims**

1. A method for purifying water containing dissolved ions utilizing a cation and anion exchange resin which comprises:

1. passing said water to be purified through a cation zone containing a cation exchange resin in the hydrogen form, and in intimate contact with said cation exchange resin;
2. removing said water from said cation zone when said water is substantially free of dissolved cations;

3. passing said water through an anion zone containing an anion exchange resin and in intimate contact with said anion exchange resin;
4. removing said water from said anion zone when said water is substantially free of anions;
5. regenerating said cation exchange resin contained in said cation zone when said cation exchange resin is substantially exhausted by passing through said cation zone and in intimate contact with said cation exchange resin a solution containing cation regenerant in a direction opposite to the flow of water having been purified, said cation zone having an internal back pressure of at least 10 pounds per square inch when said solution is in contact with said cation exchange resin, said solution containing cation regenerant being added in increasingly concentrated amount of regenerant, said solution containing cation regenerant being added in at least three different concentrations of regenerant, the initial concentration of regenerant being at least 0.5%, by weight, of regenerant based on the entire weight of the solution;
6. regenerating said anion exchange resin contained in said anion zone when said anion exchange resin is substantially exhausted by passing through said anion zone and in intimate contact with said anion exchange resin a solution containing anion regenerant in a direction opposite to the flow of water having been purified, said anion zone having an internal back pressure of at least 10 pounds per square inch when said solution containing anion regenerant is in contact with said anion exchange resin, said solution containing anion regenerant being added in increasingly concentrated amounts of regenerant and in at least two different concentrations of regenerant, the initial concentration of regenerant being at least 0.5%, by weight, of regenerant based on the entire weight of the solution;
7. removing the solution containing cation regenerant from said cation exchange resin when the cation exchange resin is substantially regenerated by passing therethrough a rinse solution of water; and
8. removing the solution containing anion regenerant from said anion exchange resin when the anion exchange resin is substantially regenerated by passing therethrough a rinse solution of water.

3,975,268

METHOD OF LARGELY ELIMINATING VOLUME CHANGE IN A RESIN BED DUE TO CHANGES IN THE pH OF LIQUID EQUIPMENT BY USE OF RESIN MIXTURES WITH COMPENSATING PROPERTIES

Bengt Gunnar Broddevall, Skoghall, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Dec. 10, 1974, Ser. No. 531,368

Claims priority, application United Kingdom, Dec. 13, 1973, 57848/73

Int. Cl.² B01D *15/04;* **B01J** *1/04*

U.S. Cl. 210—36 **12 Claims**

1. A method of treating at least two liquids of different pH values with a bed of a mixture of at least two synthetic resins and substantially eliminating volume changes in the resin bed due to changes in the pH of the liquid phase, wherein the resin mixture is brought into contact with a first liquid, the resin mixture and first liquid separated from one another and the resin mixture then brought into contact with a second liquid, one of the first and second liquids having a pH greater than 7 and the other of the first and second liquid having a pH less than 7, and wherein the resin is made up of a mixture of at least two different resins, the volumes of which depend on the pH of the liquid phase in which the resin is located, a first resin being an ion exchange resin containing pendant amino groups and having its maximum volume when located in an acid environment and its minimum volume when located in an alkaline environment, a second resin being an adsorbent resin and not an ion exchange resin and having its minimum volume when located in an acid environment and its maximum volume when located in an alkaline environment, the ratio of the two resins in the mixture being such that volume changes in each resin resulting from changes in the pH of their environment substantially compensate one another so that the resin mixture maintains a substantialy uniform volume in acid and alkaline environments.

3,975,269

PURIFICATION OF INDUSTRIAL WASTE WATERS BY FLOTATION

Ernest R. Ramirez, Lemont, Ill., assignor to Swift & Company, Chicago, Ill.

Continuation of Ser. No. 441,673, Feb. 11, 1974, abandoned. This application June 12, 1975, Ser. No. 586,361

Int. Cl.² C02C *5/12*

U.S. Cl. 210—44 **6 Claims**

1. In a process for clarifying and removing suspended and dissolved foreign particles from wastewater wherein the wastewater is subjected to flocculating conditions, the improvement which comprises first coagulating the foregin particles by mixing into the wastewater from about 10 to about 1000 ppm of a multivalent metal salt selected from the group consisting of ferric sulfate, ferric chloride, aluminum sulfate, alum and lime, next incorporating into the waste-water microbubbles having a diameter of about 10 to 500 microns and in a number in excess of about 10^8 per liter of wastewater treated so as to interact with the coagulated foreign particles to form embryo flocs of said microbubbles and coagulated foreign particles, which embryo flocs and substantially all of the wastewater remain unseparated from each other, subsequently mixing said unseparated embryo flocs and water with a polyelectrolyte polymer flocculant so as to combine a plurality of embryo flocs into a final floc which floats to the surface of the wastewater, said polyelectrolyte being added in an amount of about 0.1 to 100 ppm based on the amount of wastewater being treated and only after said step of incorporating microbubbles to form embryo flocs has ceased and only within a period of from approximately 2 seconds to about 30 minutes after initiating said step of incorporating microbubbles, and removing from the wastewater the final floc that is floating at the surface of the wastewater.

3,975,270

PROCESS FOR RECOVERING USABLE OLIVE-PROCESSING LIQUOR FROM OLIVE-PROCESSING WASTE SOLUTION

Roy Teranishi, Kensington, and Donald J. Stern, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 3, 1975, Ser. No. 637,250

Int. Cl.² C02B *1/20*

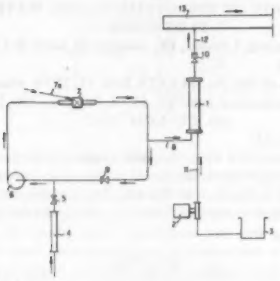
U.S. Cl. 210—53 **8 Claims**

1. A process for recovering usable olive-processing liquor from alkaline olive-processing waste solution containing contaminants, which comprises
   a. successively adding lime, charcoal, and calcium carbonate to said waste solution to form a mixture,
   b. allowing the mixture to settle to form a usable olive processing liquor and a sludge containing contaminants, and
   c. separating the usable olive-processing liquor from the sludge containing contaminants.

3,975,271
PROCESS FOR STERILIZING WATER BY THE COMBINATION OF CHLORINE AND ANOTHER HALOGEN

Bernard Saunier, 39 rue du Chemin Vert, 49 Cholet, and Antoine Derreumaux, 24 rue de Longchamp, 75116 Paris, both of France

Continuation-in-part of Ser. No. 324,382, Jan. 17, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,792
Claims priority, application France, Feb. 15, 1972, 72.04924; July 21, 1972, 72.26387
Int. Cl.² C02B *1/36*
U.S. Cl. 210—62 **7 Claims**

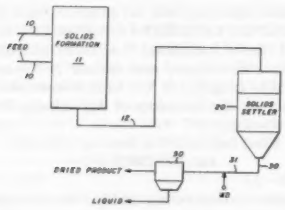


1. Process for the sterilization or the disinfection of water containing ammonia nitrogen which comprises:
   reacting in a reactor wherein the pH is maintained between 2.5 and 5.5 and the temperature above 10°C; chlorine and a bromide, the molar ratio of the amount of chlorine and of the bromide being comprised between 1/0.05 and 1/2 where 1 is for the chlorine; and
   discharging the content of said reaction into said water, thereby disinfecting said water.

3,975,272
METHOD FOR RECOVERING PHASE COMPONENTS FROM A MIXTURE OF SOLIDS AND LIQUIDS

Claude E. Bole, Gary, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 488,353, July 15, 1974, abandoned, which is a continuation of Ser. No. 288,451, Sept. 12, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,761
Int. Cl.² B01D *12/00*
U.S. Cl. 210—68 **8 Claims**

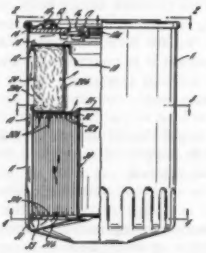


1. In the method for recovering ammonium sulfate from coke oven gas by forming a mixture of solid ammonium sulfate, and an aqueous ammonium sulfate liquid, the improvement comprising:
   a. subjecting said mixture to a separation zone for gravitational separation into a predominantly aqueous ammonium sulfate liquid region and a predominantly ammonium sulfate solids region,
   b. withdrawing from said solids region a stream of aqueous ammonium sulfate liquid and solid ammonium sulfate crystals, and introducing a condensable gas stream comprising steam at a point downstream of said point of withdrawal, said gas being at a pressure such that undissolved condensable gas is prevented from being released into said separation zone and condensing said gas in said withdrawn stream to retard liquid flow from said separation zone and thereby concentrate said sulfate crystals in said withdrawn stream, said solids region being of sufficient mass to permit withdrawal of said sulfate crystals against the pressure caused by introducing said condensable gas into said withdrawn stream, and
   c. recovering solid ammonium sulfate crystals by drying said withdrawn stream by centrifugation.

3,975,273
TWO-STAGE FLUID FILTER

Gregory P. Shaltz, and Joaquin P. Armas, both of Longmont, Colo., assignors to Parma Industries, Inc., Longmont, Colo.

Filed Aug. 29, 1974, Ser. No. 501,654
Int. Cl.² B01D *37/04*
U.S. Cl. 210—74 **14 Claims**



1. A spin-on filter for the oil lubricating system of an automotive engine, said filter comprising the combination of:
   a. a generally cylindrical housing forming fluid inlet and outlet ports in one end thereof, said housing having a screw plate at said one end thereof and forming a threaded central aperture for connecting the filter to the oil lubricating system of an automotive engine,
   b. a two-stage filter unit mounted within said housing,
      1. one stage of said filter unit comprising an annular depth type filtering medium having one surface in fluid communication with said inlet port and another surface exposed to said outlet port so that fluid can flow from said inlet port to said outlet port by flowing through said depth type medium,
      2. the other stage of said filter unit comprising at least one spirally wound strip of a surface type filtering medium with alternative pairs of opposed surfaces of the spirally wound medium being continuously bonded to each other along the circumferential edges thereof at one longitudinal end of the spirally wound medium, and with the intervening pairs of opposed surfaces of the spirally wound medium between said alternate pairs of opposed surfaces being continuously bonded to each other along the circumferential edges thereof at the other longitudinal end of the spirally wound medium, so that the spaces between said intervening pairs of opposed surfaces are open at said one longitudinal end of the spirally wound medium and the spaces between said alternate pairs of opposed surfaces are open at said other longitudinal end of the spirally wound medium,
   3. said spirally wound medium having one longitudinal end in fluid communication with said inlet port and the other longitudinal end in fluid communication with said outlet port so that fluid can flow from said inlet port to said

outlet port by flowing axially through said spirally wound medium.

3,975,274

PROCESS AND DEVICE FOR FILTERING MEDIA

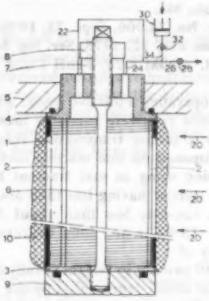
Johan P. Nommensen, Stein, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jan. 16, 1975, Ser. No. 541,691

Claims priority, application Netherlands, Jan. 17, 1974, 7400613

Int. Cl.² B01D *25/20, 25/34*

U.S. Cl. 210—82 6 Claims



1. A process for filtering particles from a stream of fluid in which the particles are carried, comprising: flowing the stream radially through a circumferential wall formed of sectional members which are axially spaced apart a predetermined distance so as to form slots therebetween of uniform predetermined width, said predetermined width not exceeding about 20 microns, the sectional members being permanently fixed at least in three points to stay rods that are approximately parallel to the axis of the wall and disposed uniformly about said axis; maintaining the stay rods in a state of axial compression during such flow by means of a tension member extending between end pieces which apply compression to the stay rods; interrupting the stream at intervals and effecting a reverse fluid flow while applying a pressure pulse to one of the end members in a direction to increase the axial spacing between sectional members, the pressure pulse being of sufficient magnitude to enlarge the slots by more than 5% and to create a back flow of fluid through the slots thereby removing any accumulated particles from the slots, the tension in the tension member being preadjusted such that during the pressure pulse tension in the tension member is increased and the compression of the stay rods is substantially relieved whereby plastic deformation of the stay rods is avoided during repeated pressure pulses so that the uniform predetermined slot width during filtration is maintained.

3. A filter candle comprising rotationally symmetrical section members arranged about an axis of symmetry so as to form a circumferential wall, said members being spaced apart a predetermined distance to form slots of uniform predetermined width, said predetermined width not exceeding about 20 microns, the sectional members being permanently fixed in at least three points to spaced apart stay rods which are generally parallel to said axis of symmetry, an end piece associated with each end of the circumferential wall, tension means extending between the end pieces, said tension means normally maintaining the stay rods in compression and normally maintaining a maximum spacing between said section members during flow of fluid through the circumferential wall, means for applying a pressure pulse to one of said end pieces in a direction to increase the spacing between said section members when it is desired to backwash the filter, the tension in said tension means being of a magnitude such that the compression of the stay rods is substantially relieved and said spacing between section members increases upon the application of said pulse.

3,975,275

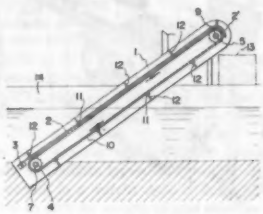
CONVEYER FOR REMOVING FLOATING OBJECTS

Shogo Kato, 2-23, Asahi, Fukushima, Fukushima, Japan

Filed Oct. 17, 1974, Ser. No. 515,714

Int. Cl.² B01D *33/32;* B65G *19/22*

U.S. Cl. 210—160 3 Claims



1. In a conveyor for removing floating objects from a body of liquid and having a plurality of parallel bars and endless chain means running below said bars with transverse frames on said endless chain means extending transversely of the parallel bars and having a plurality of teeth of the transverse bars projecting upwardly between said bars and moving along said bars during movement of the endless chain means, an improved transverse frame and tooth structure comprising a transverse bar having a channel shape cross-section with inwardly extending portions along the upper edges of the sides of the bar with a space therebetween, flat sheet-like teeth having the lower ends bent at a right angle to the main portion of the teeth, and a fixing plate having a plurality of parallel slits therein transverse to the length thereof with a width sufficient to accommodate the flat sheet-like teeth, said fixing plate having a greater width than the space between the inwardly projecting portions on the transverse bar, the teeth having the main portion positioned in the slits in the fixing plate with the bent lower ends under the fixing plate, and the fixing plate being inserted into the transverse bar with the teeth projecting through the space between the inwardly extending portions.

3,975,276

MODULAR AERATOR AND SEPARATOR ASSEMBLY FOR SEWAGE TREATMENT FACILITY

Lawrence A. Schmid, 2804 Brad Lane, Manhattan, Kans. 66502

Filed Mar. 17, 1975, Ser. No. 559,130

Int. Cl.² B01D *43/00;* C02C *1/12*

U.S. Cl. 210—207 13 Claims

1. Sewage treatment apparatus comprising:

a bottom wall adapted to hold sludge and particulate matter derived from said sewage;

particulate separation means situated above said bottom wall for removing particulate matter from sewage passing therethrough and permitting gravitation of said matter toward said bottom wall;

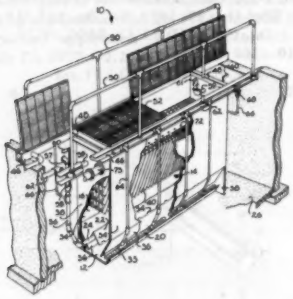
generally upright chamber-defining means presenting a chamber for directing the flow of sewage through said separation means after entrance thereof into the apparatus,

there being means defining a sewage inlet located below said particulate separation means whereby sewage entering the apparatus flows upwardly through said chamber and separation means;

aeration means located outside of said chamber and adjacent said sewage inlet for inducing a generally upwardly

directed hydraulic suction exteriorly of the chamber for increasing the turbulence and aeration of said sludge and particulate matter, and for aerating sewage entering said inlet;

baffle means in at least partial covering relationship to said aeration means for preventing clogging of the latter by



solid material within said sewage, said baffle means being in spaced relationship to said chamber-defining means with the aeration means disposed between the latter and the baffle means; and

means located above said particular separation means for permitting withdrawal of clarified liquid emerging therefrom.

3,975,277

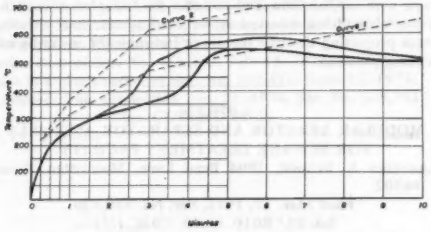
LIQUID COMPOSITION FOR THE TREATMENT OF WASTE MATERIALS

Rune Helmer Pierrou, Falun, Sweden, assignor to Nitro-Nobel A.B., Gyttorp, Sweden

Continuation of Ser. No. 347,842, April 4, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,800

Int. Cl.[2] A62D *1/00*

U.S. Cl. 252—2 **6 Claims**



1. A liquid composition suitable for the treatment of waste materials, comprising in parts by volume:

a. 1 part of a mixture of 1 part by volume of a plastic in 0 to 10 parts by volume of water, wherein the plastic is polyvinylacetate, polyvinyl acrylate, polyvinyl chloride, polystyrene or copolymers of two or more of said plastics,

b. 1 part of a solution of 0.5 to 3 parts by weight of an alkali metal sulfate in 1 to 10 parts by weight of water,

c. 0.5 to 1 part of a solution of 1 part by weight of an alkali metal acetate in 4 to 20 parts by volume of water,

d. 0.5 to 1 part of a solution of 0.25 parts by weight of an aluminum compound selected from aluminum fluoride, aluminum fluorosilicate, and alum in 10 to 40 parts by volume of water,

e. 0.5 to 1 part of a solution of 0.5 to 3 parts by weight of an alkali metal thiosulfate in 1 to 10 parts by volume of water.

f. 3 to 5 parts of water glass of 38–42 Be,

g. 0 to 10 parts of finely divided kaolin, and

h. 0 to 10 parts of crushed pumice slag,

in which, if desired, 1 part by volume of 6–60% perchloric acid may be added to 50 parts by volume of parts (a), (c), (d) and (f) in place of parts (b) and (e).

3,975,278

TRACTANTS COMPRISING LINEAR DIMERS OF α-ALKYL STYRENE

James C. Wygant, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

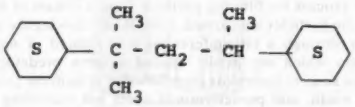
Continuation of Ser. No. 74,900, Sept. 23, 1970, abandoned. This application Feb. 12, 1975, Ser. No. 549,231

Int. Cl.[2] C10M *3/10;* **F16H** *15/08*

U.S. Cl. 252—59 **2 Claims**

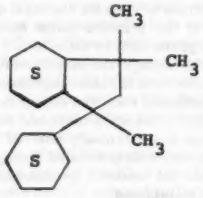
1. In a method of operating a tractive device wherein torque is transmitted between relatively rotatable members having tractive surfaces in a torque transmitting relationship and having a tractant disposed on said tractive surfaces, the improvement comprising using as said tractant hydrogenated dimers of α-methyl styrene having less than about 2 percent unsaturation and a viscosity less than about 52,400 centistokes at −20°F. (−28.9°C.), the fully hydrogenated dimer consisting essentially of

A. at least about 80 percent by weight of fully hydrogenated dimer of a linear dimer represented by the structure



and

B. from 0 to about 20 percent by weight of fully hydrogenated dimer of a cyclic dimer represented by the structure



3,975,279

HYDRAULIC FLUID COMPOSITIONS

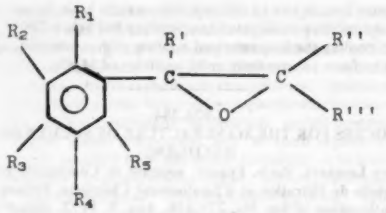
Warren L. Perlstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 24, 1975, Ser. No. 634,869

Int. Cl.[2] C09K *50/00;* **C10M** *1/48, 3/42;* **C09K** *15/06*

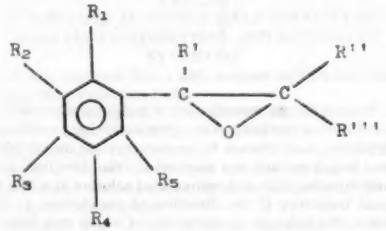
U.S. Cl. 252—78.5 **15 Claims**

1. A stabilized composition comprising a β-(halopropyl)-thionophosphate and an amount effective to stabilize said β-(halopropyl)-thionophosphate of a compound having the formula



wherein R_1–R_5 and R′ – R‴ are independently selected from hydrogen and hydrocarbyl radicals.

11. An improved petroleum hydraulic fluid containing an amount effective to enhance the antiwear properties of said fluids of β-(halopropyl)-thionophosphate and an amount effective to stabilize said β-(halopropyl)-thionophosphate of a compound having the formula



wherein R_1–R_5 and R′ – R‴ are independently selected from hydrogen and hydrocarbyl radicals.

3,975,280

STORAGE-STABLE, READILY-SOLUBLE DETERGENT ADDITIVES, COATING COMPOSITIONS AND PROCESS

Klaus Hachmann; Günther Jakobi, both of Hilden; Rudolf Weber, Dusseldorf-Holthausen; Alexander Boeck, Dusseldorf-Vennhausen, and Dieter Jung, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Mar. 19, 1975, Ser. No. 559,629

Claims priority, application Germany, Mar. 21, 1974, 2413561

Int. Cl.² C11D *7/54, 17/00*

U.S. Cl. 252—102 **16 Claims**

1. A storage-stable, readily-soluble detergent additive comprising drop-shaped to globular shaped particles, at least 70% of which have a diameter within the range of 0.1 mm to 1 mm consisting of from 1% to 75% by weight of at least one active material enhancing the washing, bleaching or biocidal effects of a detergent selected from the group consisting of (1) 10% to 70% by weight of at least one compound selected from the groups consisting of N-acyl and O-acyl compounds, carbonic acid esters and pyrocarbonic acid esters which act as an activator for percompounds, the activation value of which for the percompounds amounts to more than 3 in the Per-Acid Formation Test, (2) 1% to 75% by weight of at least one enzyme selected from the group consisting of proteases, amylases, lipases and mixtures thereof, (3) 1% to 60% by weight of at least one optical brighteners, (4) 1% to 60% by weight of at least one biocide and (5) 1 % to 30% by weight of at least one perfume or odorant, said at least one active material being substantially surrounded by and embedded in from 25% to 99% by weight of an enveloping material consisting of a mixture of

A. from 20% to 90% by weight of said mixture of at least one compound having a melting point above 30°C, selected from the group consisting of (i) saturated fatty acids having from 10 to 24 carbon atoms, saturated hydroxyfatty acids having from 10 to 24 carbon atoms and mixtures of said fatty acids and hydroxyfatty acids with up to 20% by weight of unsaturated higher fatty acids and saturated fatty acids having 8 to 10 carbons, (ii) saturated fatty alcohols having from 12 to 24 carbon atoms, and (iii) mixtures of said acids (i) and said alcohols (ii) in a weight ratio of from 4:1 to 1:1,

B. from 10% to 40% by weight of said mixtures of at least one water-soluble compound having a melting point above 30°C, selected from the group consisting of polyoxy-lower alkylene glycols having a molecular weight of from 1,000 to 20,000, non-ionic surface-active compounds and anionic surface-active compounds of the sulfonate and sulfate types, said components (A) and (B) being present in a weight ratio of from 10:1 to 1:2, and

C. from 1% to 40% by weight of said mixture of at least one water-unsoluble, but water swellable compound capable of absorbing more than 500% by weight of water, based on its dry weight, and having an average particle size in the range of from 0.001 mm to 1 mm, selected from the group consisting of (a) the alkali metal salts of copolymers of acrylic acid and from 2 to 25 mol percent of cross-linking monomers copolymerizable with acrylic acid and having more than one polymerizable double bond, (b) the alkali metal salts of copolymers of methacrylic acid and from 2 to 25 mol percent of cross-linking monomers copolymerizable with methacrylic acid and having more than one polymerizable double bond, and (c) mixtures of said salts.

12. A washing and bleaching agent consisting of (I) from 5% to 95% by weight of said stabilized bleaching assistant of claim 10, and (II) from 5% to 95% by weight of at least one compound selected from the group consisting of (a) alkali metal builder salts, (b) percompounds giving H_2O_2 in aqueous solutions and stabilizers for percompounds, (c) tensides selected from the group consisting of anionic surface-active compounds, non-ionic surface-active compounds and amphoteric surface-active compounds, (d) optical brighteners, (e) water-soluble organic builder salts, (f) antimicrobial agents, (g) soil suspension agents, (h) enzymes, (i) foam stabilizers, (j) non-surface-active foam inhibitors, (k) textile softeners, and (l) corrosion inhibitors.

16. A process for the production of the detergent additive of claim 1 which consists of dispersing solid particles of said active material in a melt of said enveloping material mixture, forming droplets of said dispersion at least 70% of which have a diameter within the range of 0.1 mm to 1 mm, by means selected from the group consisting of (1) pressure spraying through a nozzle having an opening having a diameter of from 0.3 mm to 2.5 mm at a pressure of from 10 to 30 kg/cm² and (2) spraying from a spray disc rotating at a peripheral speed of from 5 to 150 m/sec., and cooling said droplets without contact below their solidifying temperature.

3,975,281

METHOD FOR TREATING SCALE

Jack F. Tate, and Jim Maddox, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,550

Int. Cl.² C02B *5/06*

U.S. Cl. 252—180 **8 Claims**

1. A method of controlling the build-up of scale deposits selected from the group consisting of calcium sulfate scale and barium sulfate scale in an aqueous system which comprises incorporating in said system a scale treating composition

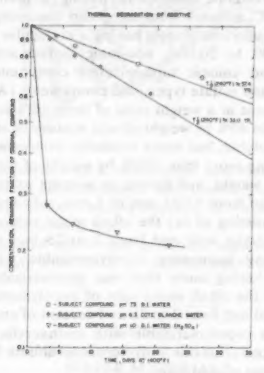
consisting essentially of an aqueous solution of a compound selected from the group consisting of an alkyl benzene sulfonic acid containing from about 8 to about 14 carbon atoms in the alkyl radical, the corresponding alkali metal and ammonium salts thereof, and mixtures thereof, in a concentration of from about 10 to about 30 ppm, on a weight basis.

3,975,282

COMPOSITION AND METHOD FOR TREATING SCALE

Jack F. Tate; Russell D. Shupe, and Jim Maddox, Jr., all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,959
Int. Cl.² C02B 5/00; C11D 1/12
U.S. Cl. 252—180 8 Claims



1. Method of controlling the buildup of inorganic mineral scale selected from the group consisting of calcium sulfate, barium sulfate and calcium carbonate in an aqueous system which comprises incorporating into said system a scale-treating composition consisting essentially of an aqueous solution of a watersoluble sulfonated, ethoxylated compound having the general formula

$$R(OCH_2CH_2)_nSO_3^-A^+$$

wherein R is a hydrocarbon group containing from about 8 to about 20 carbon atoms, n is a number from one to about ten, including fractions, and A^+ is a monovalent cation selected from the group consisting of sodium, potassium, and ammonium, including mixtures,in a concentration effective to control said inorganic mineral scale build-up, and being selected in the range of from about 0.0005% to about 0.005% on a weight basis.

3,975,283

HIGH BULK DENSITY MAGNESIUM CHLORIDE AND METHOD FOR MAKING SAME

David G. Braithwaite, Brookhaven, Miss., and William P. Hettinger, Jr., Iselin, N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,337
Int. Cl.² C09K 3/00
U.S. Cl. 252—182 10 Claims

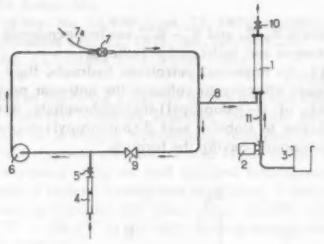
1. Method for treating magnesium chloride brine to form substantially solid particles of magnesium chloride having a bulk density of at least about 20 pounds per cubic foot and no more than about 3.0% water comprising the steps of: admixing a gelling agent and said magnesium chloride brine, said gelling agent selected from the group consisting of MgO, $Mg(OH)_2$, $MgCO_3$ and mixtures thereof, said gelling agent added in amount from 0.1 to 10.0% on a brine weight basis, homogenizing the mixture at elevated temperature but below 200°F. and then cooling the homogenized mixture with continuous agitation to form substantially solid particles of $MgCl_2$.

3,975,284

PROCESS FOR THE MANUFACTURE OF SOLUTIONS OF HALOGENS

Marc Lambert, Paris, France, assignor to Compagnie Industrielle de Filtration et d'Equipement Chimique, France

Continuation of Ser. No. 279,038, Aug. 9, 1972, abandoned. This application Dec. 2, 1974, Ser. No. 528,769
Int. Cl.² C09K 3/00
U.S. Cl. 252—187 R 1 Claim



1. Process for the manufacture of highly concentrated solutions of at least one halogen in water, comprising continuously recirculating said solution by pressure applied thereto along a closed loop trajectory in a constant circular direction, continuously injecting into said recirculated solution at a first point of said trajectory in the direction of circulation, a weaker solution, the halogen concentration of which may have a nil value, continuously injecting halogen into said circuit, at a second point of said trajectory, different from said first point, in the direction of circulation, continuously drawing off at a third point of said trajectory, distinct from said first and second points a controllably variable liquid volume which is a fraction only of said highly concentrated solution, which fraction may have a nil value, while continuously to recirculate under said pressure the remaining solution in the circuit, and automatically feeding at said first point a volume of said weaker solution equal to the volume of said drawn off fraction, said pressure applied to the solution being independent of the pressure of the weaker solution and halogen injected at said first and second points.

3,975,285

LIQUID CRYSTAL COMPOSITION

Yoshitake Ohnishi; Minoru Ozutsumi; Yoshihide Miyazawa, and Michihiro Gonda, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd. and Nippon Electric Company, Ltd., both of Tokyo, Japan

Filed Oct. 30, 1973, Ser. No. 411,297
Claims priority, application Japan, Oct. 30, 1972, 47-107947; Apr. 25, 1973, 48-47500
Int. Cl.² G02F 1/13, 1/16; C09K 3/34
U.S. Cl. 252—299 11 Claims

1. A liquid crystal composition having long-life dynamic light scattering properties under application of AC or DC voltage, comprising (1) at least one nematic liquid crystal or mixture thereof with at least one cholesteric liquid crystal, and (2) at least one additive selected from the group consisting of (A) mixtures of at least one first organic cyclic compound selected from the group consisting of naphthoquinone, diphenoquinone, stilbenequinone, anthraquinone, phenanthrenequinone, benzoanthraquinone, benzophenanthrenequinone, quinoneimine compounds, organocyclic imino compounds, benzophenone compounds, desoxybenzoin com-

pounds, dibenzyl methane compounds and triphenyl methane compounds, with at least one second organic cyclic compound selected from the group consisting of naphthohydroquinones, diphenohydroquinones, stilbenehydroquinones, hydroxyanthraquinones, hydroxyphenanthrenequinones, hydroxybenzoanthraquinones and hydroxybenzophenanthrenequinones, aromatic amino compounds, heterocyclic amino compounds and alicyclic amino compounds, and (B) third organic cyclic compounds selected from the group consisting of hydroxycyclopentenone, hydroxycyclohexenone, hydroxybicycloheptanone, hydroxyindanone, hydroxynaphthoquinone, hydroxybenzophenone, hydroxydinaphthoquinone, hydroxydiphenoquinone, benzoin, hydroxyacetophenone, hydroxyanthrone, hydroxyanthraquinone, hydroxyphenanthrenequinone, hydroxyfluorenequinone, hydroxynaphthacenquinone, hydroxybenzanthrone, fuchsone, aminocyclohexenoneimine, aminobicyclopheptanone, aminonaphthoquinone, naphthoquinoneimine, benzoquinoneimine, aminobenzophenone, aminoanthrone, aminoanthraquinone, aminohydroxyanthraquinone, aminophenanthrenequinone, aminofluorenone, aminonaphthacenquinone, aminobenzanthrone, aminofuchsone, naphthopyridone, anthrapyridone, acridone, phenazine, phenothiazine, phenooxazine and carbazole.

3,975,286

LOW VOLTAGE ACTUATED FIELD EFFECT LIQUID CRYSTALS COMPOSITIONS AND METHOD OF SYNTHESIS

Chan S. Oh, Diamond Bar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sept. 3, 1974, Ser. No. 502,658
Int. Cl.² C09K *3/34;* **G02F** *1/13*
U.S. Cl. 252—299 **8 Claims**

1. A liquid crystal composition suitable for use in twisted nematic display systems consisting essentially of the following liquid crystal constituents:

Constituent One — one or more low molecular weight negative dielectric anisotropy non-Schiff base liquid crystal compounds, comprising from about 20 to about 90 mole percent of the composition;

Constituent Two — one or more positive dielectric anisotropy non-Schiff base liquid crystal compounds, comprising from about 10 to about 80 mole percent of the composition; and

Constituent Three — one or more cholesteric liquid crystal compounds, comprising a minor constituent in the composition and being present in an operational range of concentration effective to bring about a short decay time not more than about 350 milliseconds with saturation voltages of less than about 3.3 Vrms in a 12.5 micron thick cell, said concentration being less than that which results in the predominance of cholesteric properties in the composition, said composition being nematic in its electro-optical properties.

3,975,287

LIQUID CRYSTAL COMPOSITION FOR ELECTRIC FIELD INDICATION

Masahiko Sagane, Hiratsuka, Japan, assignor to Kansai Paint Company, Ltd., Amagasaki, Japan

Division of Ser. No. 331,692, Feb. 12, 1973, Pat. No. 3,867,016. This application Oct. 22, 1974, Ser. No. 516,986
Claims priority, application Japan, Feb. 17, 1972, 47-16037
Int. Cl.² C09K *3/34;* **G02F** *1/13*
U.S. Cl. 252—299 **13 Claims**

13. A method for indicating the occurrence of an electric field including the steps:

a. employing a cholesteryl liquid crystal composition consisting essentially of from about 10 to about 60% by weight of a cholesteryl carbamate having, as the substituent group at the nitrogen atom of the carbamate a member selected from the group consisting of a phenyl group, a monocyclic aromatic hydrocarbon group having a linear aliphatic hydrocarbon group of not more than 8 carbon atoms, and a substituted hydrocarbon group, and from about 40 to about 90% by weight of cholesteric liquid crystal taken from the group consisting of cholesteryl halides, cholesteryl ethers, cholesteryl esters, cholesteryl carbonates, cholesteryl thiocarbonates, 24-methylcycloaltonol esters, 24, 28-dihydrocycloeucanol esters and cycloaltenol esters and mixtures thereof, said substituted hydrocarbon group being selected from the group consisting of a 2-(2-methoxyethoxy) ethyl group, 2-(2-ethoxyethoxy) ethyl group, 2-(2-n-propoxyethoxy) ethyl group, 2-(2-n-butoxyethoxy) ethyl group, ricinoleyl group, groups of the above listed chemical formulae diminished by a methylene group in the alpha position thereof, an anisyl group, phenetyl group, p-chlorophenyl group, and a p-nitrophenyl group; and

b. applying an electric voltage across the cholesteric liquid crystal composition and effecting a clear color change therein.

3,975,288

HIGH TEMPERATURE NON-CRYSTALLIZING CHOLESTERIC LIQUID CRYSTAL COMPOSITIONS

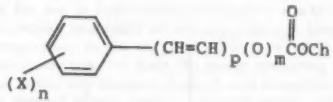
Frederick Davis, Dublin, Calif., assignor to RPR, Inc., Dublin, Calif.

Filed Jan. 2, 1975, Ser. No. 537,882
Int. Cl.² C09K *3/34;* **C07C** *97/24;* **C09B** *1/50*
U.S. Cl. 252—299 **8 Claims**

1. A composition comprising an elevated temperature cholesteric liquid crystal composition consisting essentially of:

at least about 50 weight percent of the 3-chloropropionate ester of Ch;

at least about 5 weight percent of an ester of Ch having the formula



wherein:

m is 0 or 1;

p is 0 or 1;

$p + m = 1$;

n is 0 to 3; and

X is selected from the group consisting of an alkyl radical having from 1 to 12 carbon atoms, a thiooxy radical having from 1 to 6 carbon atoms, an oxo-carbonyl radical having from 1 to 6 carbon atoms, a non-oxo-carbonyl radical having from 1 to 12 carbon atoms, an alkoxy radical, an halo radical, a cyano radical, and a nitro radical;

and from 0 to 20 weight percent of an aliphatic ester of Ch; wherein Ch is O^3-cholestanyl or -cholesteryl.

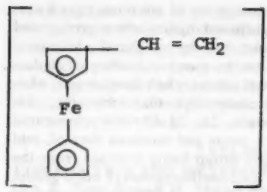
3,975,289

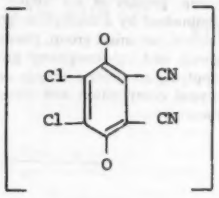
CHARGE TRANSFER COMPLEXES OF FERROCENES HAVING LIGHT FILTERING PROPERTIES

Michael F. Froix, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

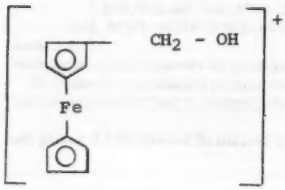
Filed Feb. 25, 1974, Ser. No. 445,388
Int. Cl.² G02B *5/20*
U.S. Cl. 252—300 **10 Claims**

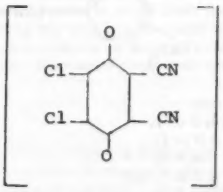
9. An optical filter comprising a filtering element containing a complex represented by the formula:





10. An optical filter comprising a filtering element containing a complex represented by the formula:





3,975,290

AEROSOL SYNTHESIS OF CERAMIC POWDERS

Richard C. Anderson, Chagrin Falls, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1973, Ser. No. 417,698

Int. Cl.² H01S *3/06*; C01F *15/00, 17/00*

U.S. Cl. 252—301.1 R **2 Claims**

1. A method of co-precipitating a mixed oxalate which comprises providing a bath containing an aqueous solution of oxalic acid, forming droplets of a Th—Nd—Y salt solution from an aerosol spray and introducing said droplets into said bath while agitating said aqueous solution.

3,975,291

PROCESS FOR PRODUCING LASER LIGHT

Uwe Claussen, Leverkusen, and Günter Oppermann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 1, 1974, Ser. No. 447,210

Claims priority, application Germany, Mar. 3, 1973, 2310748

Int. Cl.² H01S *3/20*; F21K *2/00*

U.S. Cl. 252—301.17 **3 Claims**

1. Process for producing coherent monochromatic radiation by exciting a 2-(1,2,3)-triazolyl-substituted fluorescent compound in a concentration of 10^{-1} to 10^{-5} mole/liter in an organic solvent with light of sufficient intensity and wavelength, wherein said fluorescent compound has a water solubility of less than 5 g. in 1 liter of water, a $\Delta\Delta m$ value of less than 0.300, and a molecular symmetry higher than C_s or if the molecular symmetry is of the group C_s the fluorescent compound forms a rigid system.

3,975,292

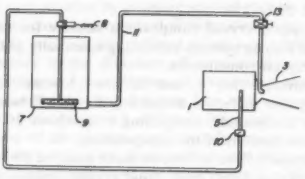
METHOD OF SCREENING INFRA-RED RADIATION

Roy E. Shaffer, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C. Division of Ser. No. 35, 380, June 10, 1960

Filed Oct. 1, 1963, Ser. No. 337,966

Int. Cl.² B01D *3/06*; C09K *3/30*

U.S. Cl. 252—305 **1 Claim**



1. A method of forming an aerosol of flake-like aluminum particles having diameters in the range of 2 to 20 microns and thicknesses of less than 3/10 micron which comprises feeding into a hot, high velocity gas stream a suspension of said particles in a hydrocarbon oil, the temperature of said gas stream being sufficient to quickly vaporize said hydrocarbon oil thereby forming a mixed stream of hot gases, hydrocarbon oil vapors and said aluminum particles, and discharging said mixed stream into the atmosphere.

3,975,293

BODIES OF SILICEOUS GELS HAVING LARGE PORES AND PROCESS FOR PREPARING SAME

Madeleine LePage, Paris, France, assignor to Produits Chimiques Pechiney-Saint Gobain, Neuilly-sur-Seine, France

Continuation of Ser. No. 147,241, May 26, 1971, abandoned. This application Oct. 11, 1973, Ser. No. 405,552

Claims priority, application France, June 4, 1970, 70.20514

Int. Cl.² B01J *13/00*; C01B *33/16*

U.S. Cl. 252—317 **15 Claims**

1. A process for increasing the pore diameter of siliceous gels without decreasing the porous volume comprising drying a siliceous hydrogel at a temperature of up to 500°C to produce bodies of a siliceous gel having an average pore diameter greater than 40 Angstroms and contacting the resulting bodies with an ammoniacal medium in the liquid or gaseous phase in an autoclave under a pressure of up to 50 bars.

3,975,294

SURFACE ACTIVE COMPOSITION

Jean Dumoulin, Villeurbame, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Nov. 2, 1973, Ser. No. 412,141
Claims priority, application France, Nov. 3, 1972, 72.38957
Int. Cl.² B01F *17/10, 17/42*; C11D *9/32*; C08L *43/04*
U.S. Cl. 252—354 4 Claims

1. A surface-active composition comprising, by weight:
a. 45 to 90% of at least one n-alkyl monoether of a polyethylene glycol, containing 4 to 9 $-CH_2CH_2O-$ units, the n-alkyl radicals containing 5 to 15 carbon atoms,
b. 5 to 35% of a sodium dialkylsulphosuccinate, the linear or branched alkyl radicals containing 6 to 12 carbon atoms,
c. 2 to 17% of at least one acid selected from oleic, linoleic, linolenic and ricinoleic acid and
d. 1.5 to 12% of at least one amine selected from triethanolamine and N-hydroxyethylmorpholine.

3,975,295

LIQUID AMINE COMPOSITIONS

S. Don Koch, Tulsa, Okla., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 256,082, May 23, 1972. This application Aug. 26, 1974, Ser. No. 500,234
Int. Cl.² B01F *17/16*; B03D *1/02*
U.S. Cl. 252—357 14 Claims

1. A liquid, freeze-thaw stable surface active composition consisting essentially of from about 10 to 90 parts by weight of (1) a C_{12}–C_{22} aliphatic primary mono-amine or an N-substituted trimethylene diamine having the formula:

$$RNHCH_2CH_2CH_2NH_2$$

wherein R is a C_{12}–C_{22} aliphatic hydrocarbon group; and correspondingly from 90 to 10 parts of (2) a 2–15 mole lower alkylene oxide adduct of said aliphatic primary mono-amine.

3,975,296

FREE-FLOWING BLENDS OF HEXA(METHOXYMETHYL)-MELAMINE, CARBON BLACK AND SILICA COMPOUNDS

Earl Kaplan, Metuchen, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,625
Int. Cl.² A23L *1/00*
U.S. Cl. 252—383 5 Claims

1. A process for improving the physical form of liquid alkyl ethers of methylolated melamines consisting essentially of blending from about 40 to 60 percent by weight of said alkyl ether of methylolated melamine with a carbon black having a dibutylphthalate value of greater than about 100, and from 1 to 10 percent by weight of a finely divided silica compound having a surface area, as determined by the BET nitrogen absorption method, of from about 40 to 200 square meters per gram, selected from synthetic hydrous calcium silicates and synthetic amorphous silicone dioxide.

3,975,297

PROCESS OF PREPARING FREE-FLOWING ANTIOZONANT BLENDS

Donald F. Moline, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1974, Ser. No. 450,136
Int. Cl.² C09K *15/16*; C08K *5/16*
U.S. Cl. 252—400 R 7 Claims

1. A process of preparing a dry, homogeneous, solid blend of an antiozonant and a rubber additive comprising
A. crystallizing molten N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine until 50 percent to 70 percent has been crystallized,
B. adding a solid rubber additive having a melting point exceeding 45° C. to the partially crystallized molten amine at a temperature below the melting point of the rubber additive,
C. completing the addition of the rubber additive before in excess of 70% crystallization has occurred, and
D. completing the crystallization, wherein the weight ratio of rubber additive to amine is from 15:100 to 50:100.

3,975,298

SPILL CONTROL COMPOSITION AND USE THEREOF

James W. Seidenberger, Bethlehem, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Oct. 22, 1975, Ser. No. 624,589
Int. Cl.² B01J *31/02*
U.S. Cl. 252—430 10 Claims

1. A composition useful for the absorption of liquid elemental mercury comprising: 41 to 52% by weight of a granular metal selected from the group consisting of zinc and copper; 41 to 52% by weight of a metal powder selected from the group consisting of zinc and copper and 5 to 9% by weight of a non-hydroscopic solid acid selected from the group consisting of sulfamic, tartaric, citric, succinic or oxalic acid.

3,975,299

PRODUCTION OF ACID HYDROCARBON CONVERSION CATALYSTS

Elizabeth Anne Crathorne, Surbiton; Ian Valentine Howell, Woking, and Robert Chalmers Pitkethly, Camberley, all of England, assignors to The British Petroleum Company Limited, London, England

Filed June 10, 1974, Ser. No. 477,841
Claims priority, application United Kingdom, June 14, 1973, 28331/73; Aug. 30, 1973, 40786/73
Int. Cl.² B01J *27/02, 27/12*
U.S. Cl. 252—432 14 Claims

1. A process for the production of a solid acidic catalyst suitable for use in hydrocarbon conversion reactions which process consists essentially of reacting antimony tetrafluoride at a temperature in the range of −50° to +140°C. with an inorganic oxide selected from the group consisting of silica, alumina, boria, and mixtures thereof, said inorganic oxide or mixture thereof having surface hydroxyl groups and an H_o value of less than −3.0.

2. A process for the production of a solid acidic catalyst suitable for use in hydrocarbon conversion reactions which process consists essentially of reacting a compound of formula XF_5 wherein X is a metal selected from the group consisting of arsenic, antimony, bismuth, tantalum, vanadium and niobium at a temperature in the range of −50° to +140°C. with an inorganic oxide derived from a silico-tungstic acid on a silica support by impregnating the silica with a solution of the acid followed by drying and then heating to drive off the water of crystallisation, said inorganic oxide having surface hydroxyl groups and an H_o value of less than −3.0.

5. A process for the production of a solid acidic catalyst suitable for use in hydrocarbon conversion reactions which process consists essentially of reacting a compound of formula XF_5 wherein X is a metal selected from the group consisting of arsenic, antimony, bismuth, tantalum, vanadium and niobium, at a temperature in the range of −50° to +140°C. with alumina having surface hydroxyl groups and which is reacted with sufficient of an agent selected from the group consisting of a fluorinating agent and sulphonating agent to partially fluorinate or sulphonate the alumina and wherein the unreacted fluorinating or sulphonating agent is removed before reacting the partially fluorinated or sulphonated alumina with the compound of formula XF_5 and said alumina having an H_o value of less than −3.0.

9. A process according to claim 5 wherein the alumina prior to reaction with XF_5 compound is mixed with an inorganic oxide selected from the group consisting of boria and silica.

3,975,300

ONE STEP METHOD OF PREPARATION OF VANADIUM-PHOSPHORUS COMPLEX IN THE ABSENCE OF HYDROGEN HALIDE

George T. Burress, Somerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,491
Int. Cl.² B01J 27/14
U.S. Cl. 252—435 8 Claims

1. A method for preparing a vanadium-phosphorus-oxygen complex catalyst that comprises mixing: (1) a vanadium compound, an organic reducing agent, and phosphoric acid or a compound which hydrolyzes to phosphoric acid; or (2) a vanadium compound, an organic reducing agent, a promoter metal compound, and phosphoric acid or a compound which hydrolyzes to phosphoric acid; to form a paste, drying the paste and calcining the resulting dried paste; thereby producing a catalyst complex consisting essentially of (1) vanadium-phosphorus-oxygen or (2) promoted vanadium-phosphorus-oxygen.

3,975,301

DEHYDROGENATION CATALYST CONSISTING OF THE CALCINED RESIDUE OF FERRIC PHOSPHATE AND LEAD PHOSPHATE

Windell C. Watkins, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 409,823, Oct. 26, 1973, Pat. No. 3,855,279. This application Aug. 20, 1974, Ser. No. 498,885
Int. Cl.² B01J 27/14
U.S. Cl. 252—437 13 Claims

1. A bismuth-free catalyst consisting essentially of the calcined residue of a mixture of ferric phosphate and lead phosphate with an atomic ratio of metal defined by 1 Fe/x Pb where x is from about 0.1 to about 10.

3. A catalyst prepared by the steps of

1. preparing a solution of salts of iron and lead,
2. precipitating from said solution a mixture of ferric phosphate and lead phosphate,
3. washing said precipitate,
4. drying said precipitate,
5. adjusting the size and shape of the catalyst particles to that desired for process use, and
6. calcining said adjusted particles at a temperature of from about 400°C. to about 600°C wherein the atomic ratio of the metals is defined by 1 Fe/xPb where x is from about 0.1 to about 10.

3,975,302

SUPPORTED CATALYST FOR OXIDIZING METHANOL TO FORMALDEHYDE AND ITS MANUFACTURING PROCESS

Philippe Courty, Nanterre; André Sugier, and Jean-Francois Le Page, both of Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf, Rueil-Malmaison, France

Filed Sept. 3, 1974, Ser. No. 502,842
Claims priority, application France, Sept. 12, 1973, 73.32874
Int. Cl.² B01J 21/04, 21/12, 23/84
U.S. Cl. 252—455 R 50 Claims

1. A process for manufacturing an impregnated supported catalyst consisting essentially of a carrier and an active phase comprising mainly molybdenum and iron in the form of oxides, in an atomic ratio of molybdenum/iron from 1.5 to 5, comprising a first step of preparing an impregnation solution containing, as metal elements, mainly molybdenum and iron, by introducing into a mixture of water with at least one alkanolamine, a solid homogeneous complex, mainly associating MoO_4^{2-} and NO_3^- anions, Fe^{3+} and NH_4^+ cations and water, the homogeneous solid complex used in the first step being an amorphous solid gel prepared by adding, under mechanical stirring and at an hourly rate by volume lower than 6,300 ml per liter and per hour, an aqueous solution of ferric nitrate at a concentration in the range of from 1 gram-atom of iron per liter and to the saturation concentration, maintained at a temperature between its freezing point and 20°C, to an ammonium molybdate solution at a concentration from 1 to 2.5 gram-atoms of molybdenum per liter, maintained at a temperature between its freezing point and 20°C, said solutions being used in relative amounts corresponding to an atomic ratio of Mo/Fe from 1.5 to 5, thereby forming a pasty composition which is converted to an opaque rigid substance which, after maturation, becomes the desired amorphous solid gel, the alkanolamine content of said mixture being sufficient for dissolving said complex, the resulting impregnation solution being used in a second step for impregnating a carrier, said impregnated carrier being dried in a third step and then roasted in a fourth step, so as to obtain the final catalyst.

3,975,303

DESULPHURIZATION CATALYSTS

Martin Keith Eyles, West Molesey, and Christopher Ronald Pout, Feltham, both of England, assignors to The British Petroleum Company Limited, London, England

Filed July 18, 1974, Ser. No. 489,566
Claims priority, application United Kingdom, Aug. 15, 1973, 38576/73
Int. Cl.² B01J 23/10, 23/84
U.S. Cl. 252—462 3 Claims

1. A catalyst, suitable for use in the hydrodesulphurisation of hydrocarbons comprising: on a refractory support, a first metal oxide component selected from the group consisting of nickel oxide and cobalt oxide in an amount to give from 1 to 10% by weight of metal, a second metal oxide component selected from the group consisting of molybdenum oxide and tungsten oxide in an amount to give from 5 to 25% by weight of metal, and a third metal oxide component selected from the group consisting of lanthanum oxide and cerium oxide in an amount to give from 0.1 to 10% by weight of metal, all percentages being by weight of the total weight of catalyst.

3,975,304

COATING A SUBSTRATE WITH SOFT PARTICLES

Paolo della Porta; Angelo Cantaluppi; Bruno Ferrario, and Paolo Montalenti, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 249,772, May 3, 1972, Pat. No. 3,856,709. This application Dec. 11, 1974, Ser. No. 531,478
The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.
Int. Cl.² B01J 21/04, 35/02
U.S. Cl. 252—463 18 Claims

1. A method of producing a substrate having a particulate coating of high surface area to mass ratio, said method comprising in sequence the steps of:

I. disposing between a substrate and an intermediate body a mixture comprising:
   A. hard substrate-embedding particles which are harder than the substrate and are harder than the intermediate body, and
   B. soft particles which are softer than the hard substrate-embedding particles and are softer than the substrate;
II. compressing the substrate and intermediate body with particles therebetween whereby the intermediate body pushes the hard substrate-embedding particles into the substrate; and
III. removing the intermediate body from the particles leaving the hard substrate-embedding particles embedded in the substrate and the soft particles adhering to the substrate,

wherein the hard substrate-embedding particles are of a size such that they are retained on a screen of 500 mesh per inch.

3,975,305
IONENE CONDUCTIVE POLYMERS AND RESULTING ELECTROGRAPHIC PRINTING BASES

Wun Ten Tai, Palos Hills, and Kenneth G. Phillips, River Forest, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 590,882, June 27, 1975. This application Oct. 6, 1975, Ser. No. 619,988

Int. Cl.² H01B *1/00*; **B32B** *27/38*

U.S. Cl. 252—500 **12 Claims**

1. A conductive coating suitable for electrographic printing and present in a continuous surface in an amount corresponding to from 0.5 to 2.5 pounds per 3,000 square feet on a paper base, said coating comprising a water-dispersible copolymer of tris(dialkylaminomethyl)phenol and lower alkyl quaternary salt adduct thereof with a chain extender selected from a member of the group consisting of 1,4-dichlorobutene-2 and epichlorohydrin.

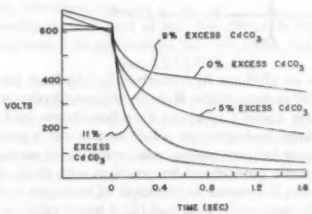
3,975,306
METHOD FOR IMPROVING THE PHOTO-INDUCED DISCHARGE CHARACTERISTICS OF CERTAIN CADMIUM CHALCOGENIDES

Robert N. Jones, Fairport, N.Y., and David J. Swarthout, Arlington, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1974, Ser. No. 519,162

Int. Cl.² G03C *1/00*

U.S. Cl. 252—501 **19 Claims**



1. A method for improving the photo-induced discharge characteristics of certain cadmium chalcogenides selected from the group of CdS, CdTe, CdAs, CdSe and CdSSe which comprises calcining a mixture of the cadmium chalcogenide or a precurser thereof in the presence of cadmium oxide or a compound which decomposes upon heating to cadmium oxide in an amount sufficient to provide an excess up to about 40 percent of unreacted cadmium oxide after calcination.

3,975,307
PTC THERMISTOR COMPOSITION AND METHOD OF MAKING THE SAME

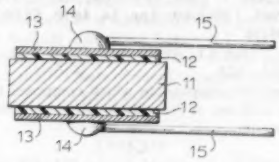
Yoshihiro Matsuo, Neyagawa; Masanori Fujimura, Hirakata; Tomizo Matsuoka, Neyagawa, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 9, 1974, Ser. No. 513,474

Int. Cl.² H01B *1/08*

U.S. Cl. 252—520 **16 Claims**

16. A method of producing a PTC thermistor comprising preparing a mixture consisting of $BaCO_3$ and TiO_2 to be converted into 99.89 to 95.73 percent by weight of $BaTiO_3$, less than 1.30 percent by weight of TiO_2 and 0.05 to 0.22 percent by weight of one oxide selected from the group consisting of Nb_2O_5 and Y_2O_3, calcining the mixture at a temperature of 900 to 1250°C, milling the calcined material with additives of less than 1.26 percent by weight of Al_2O_3, 0.05 to 1.24 percent by weight of SiO_2, 0.007 to 0.09 percent by weight of Li_2CO_3, 0.003 to 0.04 percent by weight of MnO_2 and less than 0.12 percent by weight of one oxide selected from the group consisting of Sb_2O_3 and Bi_2O_3, pressing the mixture of the calcined material and said additives into a pressed body, firing the



pressed body at a temperature of 1240°C to 1400°C for 0.5 to 5 hours, thereafter cooling the fired body to a temperature less than 800°C at a cooling rate lower than 300°C per hour, and thereafter cooling the thus cooled body to room temperature.

3,975,308
PREPARATION OF PYROPHOSPHATES

Thomas A. Myles, Township of Tonawanda, and Curtis E. Zimmer, Youngstown, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,118

Int. Cl.² H01B *1/06*

U.S. Cl. 252—520 **9 Claims**

1. A process for preparation of pyrophosphates selected from the group consisting of SiP_2O_7, ZrP_2O_7, $Ba_2P_2O_7$, $Pb_2P_2O_7$, $Mg_2P_2O_7$, and $Mn_2P_2O_7$ which comprises:

a. preparing a blend of an oxide selected from the group consisting of oxides of silicon, zirconium, barium, lead, magnesium and manganese with a stoichiometric excess of at least 40 percent of a source of P_2O_5;

b. placing said blend in a reaction vessel which is non-reactive with the materials in the blend;

c. raising the temperature of said blend and reaction vessel to a reaction temperature at a rate of at least 200°C per hour;

d. maintaining said blend and reaction vessel at said reaction temperature for at least 4 hours; and

e. cooling to room temperature.

3,975,309
2,4-DIHYDROXY-3-METHYL-BENZALDEHYDE PERFUME COMPOSITIONS

Kurt Kulka, New York, and Teodosij Zazula, Rego Park, both of N.Y., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed June 26, 1975, Ser. No. 590,415

Int. Cl.² C11B *9/00*

U.S. Cl. 252—522 **4 Claims**

1. A perfume composition comprising at least 1% by weight of 2,4-dihydroxy-3-methyl benzaldehyde and at least 1% by weight of one or more other perfume components.

3,975,310
CYCLOALIPHATIC UNSATURATED KETONES AS ODOR- AND TASTE-MODIFYING AGENTS

Ervin Kováts, Lausanne; Edouard Demole, Geneva; Günther Ohloff, Bernes, Geneva, all of Switzerland, and Max Stoll, deceased, late of Lully, Geneva, Switzerland, by Suzanne Stoll, executrix, assignors to Firmenich S.A., Geneva, Switzerland

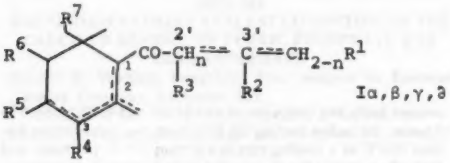
Division of Ser. No. 35,594, May 7, 1970, which is a continuation-in-part of Ser. No. 774,179, Nov. 7, 1968, abandoned. This application Sept. 6, 1974, Ser. No. 503,738

Claims priority, application Switzerland, Nov. 9, 1967, 15667/67; Nov. 1, 1968, 16309/68; May 7, 1969, 6976/69; Aug. 8, 1969, 12065/69; Apr. 14, 1970, 5559/70; Apr. 17, 1970, 5725/70

Int. Cl.² A61K 7/46; C11B 9/00

U.S. Cl. 252—522 **40 Claims**

1. A perfume composition which comprises having added thereto at least one of the substantially pure compounds having the formula



Iα,β,γ,δ

containing one double bond in position 2'- or 3'- of the acyl side-chain and either one double bond in position 1- or 2- or two conjugated double bonds in positions 1- and 3- of the cycle, the double bonds being represented by dotted lines, and wherein n is zero or 1, R^1, R^2 and R^3 represent hydrogen or one of them a lower alkyl radical and the others hydrogen, and R^4, R^5, R^6 and R^7 represent hydrogen or one of them a lower alkyl radical and the others hydrogen.

3,975,311
3,7-DIMETHYL-OCTA-2,6 DIENYL-MERCAPTAN PERFUME COMPOSITION

Daniel Helminger, Dubendorf; Dietmar Lamparsky, Wangen-Dubendorf; Peter Schudel, Grut; Jost Wild, Zurich, and Trudi Sigg-Grütter, Winterthur, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 534,930, Dec. 20, 1974, which is a division of Ser. No. 251,000, May 8, 1972, Pat. No. 3,896,176. This application Sept. 8, 1975, Ser. No. 611,467

Int. Cl.² C11B 9/00

U.S. Cl. 252—522 **1 Claim**

1. A perfuming composition containing from 0.001 and 5 wt. % of 3,7-dimethyl-octa-2,6-dienyl-mercaptan.

3,975,312
DETERGENT COMPOSITIONS

James Francis Davies; Philip Alan Gilbert, and Laurence Thompson, all of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 250,442, May 4, 1972, abandoned. This application May 16, 1974, Ser. No. 470,503

Claims priority, application United Kingdom, May 12, 1971, 14421/71

Int. Cl.² C11D 3/34, 3/065

U.S. Cl. 252—535 **5 Claims**

1. A detergent composition for fabric washing comprising a synthetic anionic, nonionic, amphoteric or zwitterionic detergent active compound and a detergency builder which forms insoluble calcium and magnesium salts and is selected from the group of water soluble and dispersible alkali metal salts of alkane (C_{15}–C_{22})-1,2-sulphinic-sulphonic acids and alkane (C_{15}–C_{22})-1,2- disulphonic acids, the amount of the detergent active compound being from about 10% to 50% by weight of the composition, and the ratio by weight of the detergent active compound to the detergency builder being from about 3:1 to 1:10.

3,975,313
SOLID AMPHOTERIC SKIN CLEANSER

Jesse Bedford Shelmire, Jr., 4413 Larchmont, Dallas, Tex. 75205

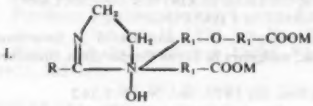
Filed June 19, 1974, Ser. No. 480,814

Int. Cl.² C11D 1/84, 3/20

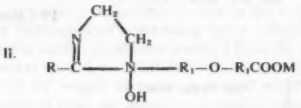
U.S. Cl. 252—542 **13 Claims**

1. A process for manufacturing a solid amphoteric skin cleanser comprising:

a. heating a mixture of: (1) an amphoteric surfactant compound selected from the group consisting of:

I. 

, and

II. 

wherein R is an aliphatic hydrocarbon having from about 4 to about 20 carbon atoms; R_1 is an aliphatic hydrocarbon having from about 1 to about 4 carbon atoms; and M is selected from hydrogen, an alkali metal, and a primary, secondary or tertiary amine, said amphoteric surfactant being partially neutralized by reaction with from about 0.3 to about 0.7 molar equivalents of base per mole of said amphoteric surfactant, and (2) a hexahydric alcohol selected from the group consisting of ducitol, mannitol, and sorbitol, the molar ratio between said hexahydric alcohol and said amphoteric surfactant being in the range from about 2:1 to about 2:3; said heating occurring at a temperature of from about 155°C to about 165°C to form a homogeneous liquid compositions; and

b. cooling said homogeneous liquid to form a solid composition.

3,975,314
STANNOUS SALT CATALYZED EPOXY SYSTEMS

Rostyslaw R. Smyk, Chicago, and Rafat T. Rabi, Villa Park, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 10, 1974, Ser. No. 511,393

Int. Cl.² C08G 59/42, 59/68

U.S. Cl. 260—2 EP **12 Claims**

1. A rapid curing oxidizable epoxy resin-based coating composition of high solids content and possessing an extended working period comprising consisting essentially of a fluid mixture of a cyclohexene oxide moiety containing polyepoxide component having a 1,2 epoxy equivalency of at least 1.2, a carboxyl functional material reactive with said polyepoxide to cure the same, from 5–25% by weight of nonreactive organic solvent, and from 0.1–2.0% of stannous chloride as catalyst, based on the total weight of materials subjected to cure, the ratio of polyepoxide component to carboxyl functional material providing a ratio of equivalents of oxirane to equivalents of carboxyl of from about 0.5:1 to 20:1.

3,975,315
EXPANDABLE RIGID VINYL CHLORIDE POLYMER COMPOSITIONS

Clarence E. Parks, Bay Village, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 226,260, Feb. 14, 1972, abandoned, and a continuation-in-part of Ser. No. 863,693, Oct. 3, 1969, abandoned. This application Oct. 12, 1973, Ser. No. 405,884

Int. Cl.² C08J *9/00*

U.S. Cl. 260—2.5 R **16 Claims**

1. An expandable composition adapted to form substantially gel-free extruded expanded vinyl chloride polymer articles having densities in the range from about 0.38 to about 0.95, substantially free of plasticizers, volatile liquids and solvents comprising (1) a vinyl chloride polymer in amounts of about 50 to 90 weight percent having a specific viscosity of less than 0.6 and 10 to 50 weight percent of polyvinyl chloride having a specific viscosity of greater than 0.6 or a chlorinated polyvinyl chloride, (2) about 5 to 20 weight parts, based on 100 weight parts of (1) of a polymer of a styrene containing more than 25% of styrene and at least one comonomer selected from the group consisting of an acrylonitrile and an alkyl alkacrylate, said styrene copolymer having a dilute solution viscosity greater than 1.5, and a blowing agent consisting essentially of nitrogen releasing chemical blowing agents.

3,975,316
CURING LIQUID POLYURETHANE PREPOLYMERS

Jose L. Villa, Highstown, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 250,319, May 4, 1972, abandoned. This application Nov. 29, 1973, Ser. No. 419,990

Int. Cl.² C08J *9/02*

U.S. Cl. 260—2.5 AK **25 Claims**

1. A composition comprising the reaction product of (a) a liquid isocyanate-terminated polyurethane prepolymer and (b) about 10% to 100% by weight, based on the weight of said prepolymer, of an aqueous colloidal dispersion selected from aqueous alkali metal silicates containing about 20% to 60% solids and having an $M_2O:SiO_2$ ratio of about 1:1 to 1:4 where M is an alkali metal, and aqueous magnesium oxide containing about 5% to 40% by weight solids.

8. A rigid, fine-celled polyurethane foamed plastic comprising the reaction product of (a) at least one liquid polyurethane polymer having at least three free isocyanate groups per molecule and a molecular weight of 400 to 5000 and (b) 10% to 100% by weight, based on the weight of said prepolymer, of aqueous alkali metal silicate containing 20% to 60% by weight of solids and having an $M_2O:SiO_2$ ratio of 1:1 to 1:4 wherein M is an alkali metal.

3,975,317
METHOD OF PREPARING NON-FRIABLE RIGID POLYURETHANE FOAM

Robert V. Russo, Brooklyn, N.Y., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Jan. 30, 1975, Ser. No. 545,728

Int. Cl.² C08G *18/14, 18/24, 18/18*

U.S. Cl. 260—2.5 AC **7 Claims**

1. A method for preparing a flame retardant, rigid polyurethane foam of reduced friability from halogen-containing polyols by reacting

a. 100 parts of a saccharide based polyol containing 4 hydroxyl groups, between 25 and 50% by weight of chlorine or bromine and exhibiting a hydroxyl number of between 175 and 800, the polyol being derived from the reaction of a bromine- or chlorine-containing olefin oxide containing between 3 and 12 carbon atoms with (1) a saccharide selected from the group consisting of dextrose, sucrose, α-methyl glucoside, (2) a reaction product of said saccharide with water or an alcohol containing between 2 and 4 hydroxyl radicals, or (3) said reaction product which has subsequently been oxyalkylated,

b. a polyfunctional isocyanate exhibiting a functionality of between 2.2 and 2.8, wherein the total number of equivalents of isocyanate is between 0.95 and 1.2 times the number of equivalents of hydroxyl radicals present in said polyol, said reaction being conducted in the presence of between 20 and 40 parts of a foaming agent selected from the group consisting of halogenated aliphatic hydrocarbons exhibiting a boiling point of between −30° and 80°C., between 0.05 and 0.5 part of a polymerization catalyst of the formula $(CH_3)_2Sn(SR^1COOR^2)_2$ wherein R^1 is an alkylene radical containing between 1 and 12 carbon atoms and R^2 is selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms, cycloalkyl, aryl, alkaryl and aralkyl radicals, between 0.2 and 1.5 parts of a tertiary amine cocatalyst and between 0.5 and 3 parts of a silicone oil surfactant.

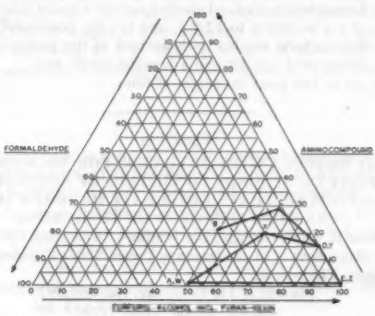
3,975,318
POLYFURAN FOAMS AND A METHOD OF PREPARING SAME

Hans-Ole Larsen, Hvidovre; Sven Barfoed, Copenhagen, both of Denmark, and John Arthur Gooch Gent, Liphook, England, assignors to Wolff & Kaaber, Farum, Denmark

Division of Ser. No. 388,168, Aug. 14, 1973, Pat. No. 3,919,127. This application June 19, 1975, Ser. No. 588,456

Int. Cl.² C08J *9/14, 9/08*

U.S. Cl. 260—2.5 F **15 Claims**



1. A synthetic furfuryl alcohol polymer foam having a density of at least about 20 kg/m³ and substantially no exotherm at 200°C. comprising:

1. 100 parts by weight of the polymerization product, at least 50 parts by weight of which are derived from furfuryl alcohol, of (a) 10 to 75 parts by weight of a furfuryl alcohol resin, (b) 10 to 80 parts by weight of a melamine-formaldehyde-furfuryl alcohol resin in a molar ratio range of 1:1 to 10:0.5 to 12:0.5, and (c) the remainder being free furfuryl alcohol, polymerized in the presence of a strong acid catalyst and a blowing agent, and
2. up to 100 parts by weight of filler.

3,975,319
POLYFURAN FOAMS AND A METHOD OF PREPARING SAME

Hans-Ole Larsen, Hvidovre; Sven Barfoed, Copenhagen, both of Denmark, and John Arthur Gooch Gent, Liphook, England, assignors to Wolff & Kaaber, Farum, Denmark

Division of Ser. No. 388,168, Aug. 14, 1973, Pat. No. 3,919,127. This application June 19, 1975, Ser. No. 589,488

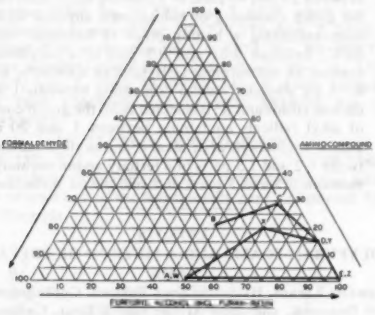
Int. Cl.² C08J *9/14, 9/08*

U.S. Cl. 260—2.5 F **15 Claims**

1. A synthetic furfuryl alcohol polymer foam having a den-

sity of at least about 20 kg/m³ and substantially no exotherm at 200°C. comprising:

1. 100 parts by weight of the polymerization product, at least 50 parts by weight of which are derived from furfuryl alcohol, of (a) 10 to 75 parts by weight of a furfuryl



alcohol resin, (b) 10 to 80 parts by weight of a thiourea-formaldehyde-furfuryl alcohol resin in a molar ratio range of 1:1 to 10:0.5 to 12:0.5, and (c) the remainder being free furfuryl alcohol, polymerized in the presence of a strong acid catalyst and a blowing agent; and

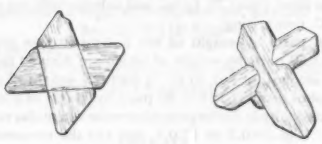
2. up to 100 parts by weight of filler.

3,975,320

BY-PRODUCT GYPSUM FILLERS FOR MICA-FREE JOINT COMPOUNDS CONSISTING OF SYNTHETIC CALCIUM SULPHATE DIHYDRATE HAVING A MEAN PARTICLE SIZE OF 11 OR 12 MICRONS

Marvin K. Lane, Chicago, and Winton C. Anderson, Elk Grove Village, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed May 11, 1973, Ser. No. 359,392
Int. Cl.² C04B *11/00, 11/02*
U.S. Cl. 260—17 R **7 Claims**



1. A crack-resistant, drying type joint compound for finishing joints between wallboards when mixed with water, the compound including a filler, a binder, and a thickener;

said filler consisting essentially of synthetic calcium sulfate dihydrate having a particle size distribution characterized by:

a mean particle size of between about 11 and about 12 microns,

particles having a size smaller than one micron comprising between about 5% and about 6.5% by weight of the filler, and

a packed dry bulk volume no greater than about 93 cc. per 100 grams.

3,975,321

SOUND REPRODUCTION COMPOSITIONS

Charles A. Heiberger, Princeton, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa. 18105

Filed May 13, 1974, Ser. No. 469,430
Int. Cl.² C08F *214/06;* **C08K** *3/10;* **C08L** *91/00*
U.S. Cl. 260—18 PF **15 Claims**

1. A phonograph record comprising a disc formed from a synthetic resin molding composition comprising as the resin therein a copolymer of vinyl chloride with propylene, said copolymer containing from about 4 to 8% by weight of propylene, and said copolymer having an intrinsic viscosity from about 0.45 to 0.7 dl./g. and a melt flow rate from about 50 to 500 dg./min. at 190°C.

3,975,322

RAPID DRYING EPOXY RESIN ESTER

H. Alan Reinshagen, Greensburg, and Leonard E. Edelman, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,824
Int. Cl.² C08L *91/00;* **C09D** *5/08*
U.S. Cl. 260—18 EP **12 Claims**

1. A rapid drying epoxy resin ester comprising:

the reaction product of

A. about 25 to about 50% (based on total solids) of a drying oil-derived fatty acid; and

B. chain-extended epoxy resin consisting of the reaction product of

1. diglycidyl ether of a diphenol; and

2. bisphenol S, where the percentage of diglycidyl ether of a diphenol in said chain-extended epoxy resin is X and the percentage of bisphenol S in said chain-extended epoxy resin is 100-X, where

$$X = (100)\frac{E_B(125) + E_B)}{E_B(125 + E_D)}$$

and E_B is between about 600 and about 2000 and E_D is the epoxy equivalent weight of said diglycidyl ether of a diphenol.

3,975,323

COPOLYESTERS, METHOD OF MANUFACTURING SAME, AND HOT MELT ADHESIVE COMPOSITIONS INCORPORATING SAME

Paul C. Georgoudis, Dunellen; Jules E. Schoenberg, Scotch Plains; Dilip K. Ray-Chaudhuri, Somerville, and Paul P. Puletti, Glen Gardner, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jan. 21, 1975, Ser. No. 542,692
Int. Cl.² C08L *91/00*
U.S. Cl. 260—22 D **23 Claims**

1. A thermoplastic copolyester, characterized by a glass transition temperature less than 25°C and a melting temperature greater than 70°C, of

A. at least one aromatic dicarboxylic acid member selected from the group consisting of a symmetrical aromatic dicarboxylic acid and the acid-functioning derivatives thereof,

B. at least one dimer acid,

C. at least one C_2—C_{10} glycol, and

D. at least one polyester polyol member selected from the group consisting of

i. a polycaprolactone polyol having a molecular weight of from about 500 to about 5,000 and a functionality greater than 2, said polycaprolactone polyol being present in an amount from about 1 to about 6 mole percent of the total dicarboxylic acid members in said copolyester, and

ii. a mixture of a polycaprolactone diol having a molecular weight of from about 300 to about 5,000, and a non-polymeric polyol having a functionality greater

than 2, said polycaprolactone diol and said non-polymeric polyol each being present in said mixture in an amount from about 1 to about 6 mole percent of the total dicarboxylic acid members in said copolyester.

3,975,324

NON-HYDROSCOPIC ZINC HALIDE COMPOSITIONS

Rudolf Adolf Behrens, Sparta, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 19, 1971, Ser. No. 173,324

Int. Cl.² C08G *18/67*

U.S. Cl. 260—23 TN **5 Claims**

1. A method of vulcanizing a sulfur-vulcanizable polyurethane elastomer containing pendant non-benzenoid unsaturation which comprises mixing with each 100 parts by weight of said polyurethane (a) from about 0.5 part to about 3.0 parts by weight sulfur, (b) from about 2.5 parts to about 7.0 parts by weight of one or a combination of accelerators selected from the group consisting of 2-mercaptobenzothiazole, 2,2'-dithiobisbenzothiazole and 2-mercaptothiazoline, and (c) from about 0.5 part to about 5.0 parts by weight of a non-hygroscopic zinc halide composition comprising an anhydrous zinc halide selected from the group consisting of zinc chloride, zinc bromide and zinc iodide in intimate combination with from about 1 part to about 10 parts per part of zinc halide of a fatty acid or fatty acid soap containing from 8 to 20 carbon atoms, and heating to a temperature sufficient to effect vulcanization.

3,975,325

ANTISTATIC AGENT COMPOSITION

William Penuel Long, Jr., Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Aug. 27, 1973, Ser. No. 391,543

Int. Cl.² C08F *6/26, 14/06*

U.S. Cl. 260—23 XA **1 Claim**

1. An antistatic synthetic resin composition comprising a polyvinyl chloride homopolymer resin and an effective amount of a blend of

a. zinc stearate and

b. a blend of N,N'-bis(2-hydroxyethyl) stearylamine stearate and stearyl alcohol wherein the ratio by weight of said stearylamine to stearyl alcohol is from about 4:1 to 1:1.

3,975,326

PROCESS FOR THE ADDITION OF ADDITIVES TO THERMOPLASTICS

Christiaan G. de Vrieze, Schinnen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Mar. 4, 1975, Ser. No. 555,274

Claims priority, application Netherlands, Mar. 5, 1974, 7402924

Int. Cl.² C08K *5/01, 5/20*; C08L *91/00*

U.S. Cl. 260—23 H **11 Claims**

1. In a process for adding to a molten thermoplastic resin or to a solution of a thermoplastic resin solid additives including heat stabilizers, antioxidants, UV-stabilizers, lubricants, antistatic agents, antiblocking agents and corrosion-inhibitors and containing only minor amounts, if any, of finely divided non-melting compounds which additives comprise at least one metal salt of an aliphatic carboxylic acid of at least 10 carbon atoms, said metal being a metal of Group I, II or III of the Periodic Table, said metal salt having a melting point of up to 250°C, the improvement comprising mixing said metal salt of an aliphatic carboxylic acid of at least 10 carbon atoms containing additive composition with at least 10% by weight, based on the weight of said salt, and up to 200% based on said salt, of an amide of a carboxylic acid having at least 10 carbon atoms and a mineral oil which is substantially non-volatile under the process conditions, to form a mixture and heating the mixture to a molten state, at a temperature less than the melting point of said additive and subsequently adding said melt to a themoplastic which is molten or in solution wherein the amount of each additive is up to 1% by weight based on the weight of the thermoplastic resin, wherein the amount of said mineral oil is at least 10% by weight of the total amount of said additives and is up to three times the weight of said additives.

3,975,327

PARTICULATE, EXPANDABLE SELF-EXTINGUISHING STYRENE POLYMERS SHOWING GOOD PROCESSABILITY

Eckhard Nintz; Rupert Schick; Heinrich Horaček, all of Ludwigshafen, and Erhard Stahnecker, Ziegelhausen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 18, 1974, Ser. No. 451,871

Claims priority, application Germany, Mar. 23, 1973, 2314544

Int. Cl.² C08J *9/00*

U.S. Cl. 260—2.5 B **8 Claims**

1. Expandable, self-extinguishing particles of polymers containing at least 50% by weight of polymerized units of styrene, said particles containing from 0.2 to 3% by weight of a flame-proofing compound selected from the group consisting of tetra-bromobutane, dibromoethylbenzene, pentabromomonochlorocyclohexane, brominated organic monomers and brominated organic phosphates, and brominated oligomers of butadiene and of isoprene, having a degree of polymerization of from 2 to 2,000, said particles further containing from 3 to 15% by weight of an expanding agent of from 2.5 to 30% by weight of a hydrocarbon of from 3 to 6 carbon atoms and from 97.5 to 70% by weight of monofluorotrichloromethane, based on the total weight of the expanding agent.

3,975,328

METHOD FOR MANUFACTURE OF POLYMER HAVING DIFFERENT STEREOSPECIFIC STRUCTURES AT DESIRED RATIO FROM VINYL MONOMERS

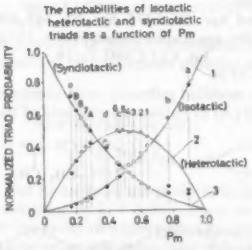
Shoei Fujishige, Yokohama, and Mitsuo Suzuki, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,785

Claims priority, application Japan, Nov. 8, 1973, 48-125603

Int. Cl.² C08F *4/56, 16/36, 20/18, 20/44*

U.S. Cl. 260—63 R **6 Claims**



1. A method for the manufacture of a polymer, which comprises dissolving an alcoholate selected from the group consisting of sodium methylate, sodium ethylate, sodium butylate, potassium methylate, potassium ethylate and potassium butylate free of interfering amounts of an alcohol in a non-protonic, polar organic solvent, admixing a radical polymerization inhibitor and a vinyl monomer selected from the group consisting of acrylic esters, methacrylic esters, vinyl ketones, α-methylvinyl ketones, β-methyl crotonic esters, acrylonitrile

and methacrylonitrile into said alcoholate containing solvent in amounts such that the molar ratio of said alcoholate to said vinyl monomer is not more than 1:35, and subjecting said vinyl monomer to anionic polymerization, whereby a high molecular weight polymer is obtained having a stereospecific structure which conforms to Bernoullian statistics.

3,975,329
INDUSTRIAL POLYESTER YARN

James M. Barnewall, Munroe Falls, and Anthony S. Scheibelhoffer, Barberton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 2, 1974, Ser. No. 429,613
Int. Cl.² C08G *63/46*
U.S. Cl. 260—75 T **3 Claims**

1. A polyester filament, essentially free of unreacted carbodiimide and having a carboxyl end group concentration ranging from 2–10 equivalents per 10^6 grams, prepared by melt extrusion of a reaction mixture consisting of

A. a polyester resin having a free carboxyl group concentration ranging from 0 to 30 equivalents per 10^6 grams and an intrinsic viscosity of at least 0.75 as measured in a 60/40 phenol/tetrachloroethane mixed solvent at 30° C. and

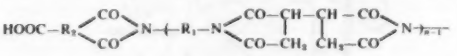
B. at least one carbodiimide selected from the group consisting of mono- and bis-carbodiimides corresponding to the formulae R—N=C=N—R′ and R—N=C=N—R″—N=C=N—R′ where R, R′ and R″ are substituted and unsubstituted radicals selected from the group consisting of C_4–C_{20} alkyl radicals, cycloalkyl radicals and aryl radicals, said substitution being selected from the group consisting of halogen atoms, nitro groups, amino groups, sulfonyl groups, hydroxyl groups and alkyl and alkoxy radicals, wherein said carbodiimide, (B), is present in said reaction mixture in an amount equivalent to the free carboxyl group concentration of the polyester resin, (A), before the melt extrusion thereof plus an amount equivalent to the free carboxyl group concentration generated by the polyester resin, (A), during the melt extrusion thereof in the absence of the carbodiimide, (B).

3,975,330
IMIDE-MODIFIED POLYESTER RESIN AND WIRE ENAMEL CONTAINING THE IMIDE-MODIFIED POLYESTER RESIN

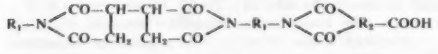
Yasuhiro Suzuki, and Katsuhiko Yamaguchi, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Apr. 18, 1975, Ser. No. 569,436
Claims priority, application Japan, May 1, 1974, 49-48278
Int. Cl.² C08G *73/16*
U.S. Cl. 260—75 N **37 Claims**

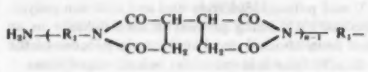
1. An imide-modified polyester resin comprising the reaction product of (A) (1) a dicarboxylic acid of the formula (I)



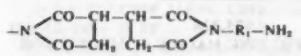
(I)



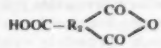
wherein R_1 represents a divalent organic group; R_2 represents a trivalent aromatic organic group and $n \geq 1$, or (A) (2) a mixture of at least about 5% by weight of said dicarboxylic acid of the formula (I) with up to about 95% by weight of at least one other polycarboxylic acid or the lower alkyl ester thereof; with (B) a polyhydric alcohol; said dicarboxylic acid of the formula (I) comprising the reaction product of 1 mole of an imide compound having terminal amino groups of the formula (II)



(II)

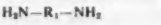


wherein R_1 has the same meaning as above, or of an imide precursor thereof, with 2 moles of a tricarboxylic acid anhydride of the formula (III)



(III)

wherein R_2 has the same meaning as above, said imide compopund of the formula (II) comprising the reaction product of n moles of 1,2,3,4-butanetetracarboxylic acid with $(n+1)$ moles of a diamine of the formula (IV)



(IV)

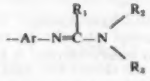
wherein R_1 has the same meaning as above.

3,975,331
PROCESS FOR PRODUCING AROMATIC POLYAMIDES FROM AMIDINE DERIVATIVES OF POLYAMIDE FORMING REACTANTS

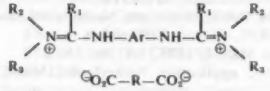
John W. Spiewak, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 20, 1973, Ser. No. 426,879
Int. Cl.² C08G *69/32*
U.S. Cl. 260—78 R **25 Claims**

1. A process for forming a filament forming, aromatic polyamide which comprises heating an amidine composition of matter characterized by the group:



to a temperature of at least 225°C where a volatile alkyl amide is evolved, said amidine comprising:
a dibasic acid salt of a bis-amidine having the general formula:



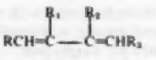
wherein Ar is a divalent aromatic radical, R_2 and R_3 are each a lower alkyl radical containing from 1 to 3 carbon atoms, and R_1 is hydrogen or a C_1 – C_3 lower alkyl group.

3,975,332
EPOXIDIZED COPOLYMERS

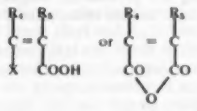
Roy S. Anderson, Broomall, Pa., and John F. Pendleton, Barrington, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,627
Int. Cl.² C08F *8/08*
U.S. Cl. 526—15 **14 Claims**

1. An epoxidized copolymer obtained by epoxidation of from about 5% to 100% of the olefinic double bonds in a copolymer of (1) from about 1% to about 99%, on a molar basis, of a conjugated diene having the formula



where R, R_1, R_2 and R_3 are hydrogen, halogen, alkoxy, aryl, cycloalkyl or alkyl having from 1 to 8 carbon atoms, and (2) a carboxylic olefin having the formula



where R_4 and R_5 are hydrogen, chlorine or lower alkyl, and X is hydrogen or carboxyl, said copolymer having an intrinsic viscosity of from about 0.05 to about 6.0.

3,975,333

BIS (2-BENZTHIAZOLE-DITHIO)-N,N'-PIPERAZINES AND THEIR USE AS VULCANIZING AGENTS

Rüdiger Schubart, and Ulrich Eholzer, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

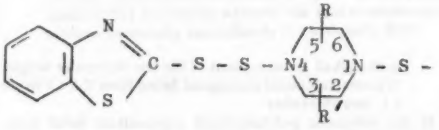
Division of Ser. No. 238,979, March 28, 1972. This application Dec. 9, 1974, Ser. No. 530,496

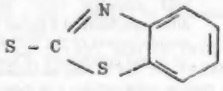
Claims priority, application Germany, Mar. 30, 1971, 2115294

Int. Cl.² C08F 28/06; C08K 5/47

U.S. Cl. 260—79.5 C 11 Claims

1. A process for the vulcanization of a natural or synthetic rubber, in which a mixture of the rubber and a bis-(2-benzthiazole-dithio)-N,N'-piperazine of the formula





in which R and R' are the same or different and each represents hydrogen or alkyl having 1–6 carbon atoms,

is heated to a temperature of from 100° to 300°C.

3,975,334

POLYMERIC ORGANOTIN HYDRIDE REAGENTS

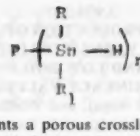
Ned M. Weinshenker, Palo Alto, Calif., assignor to Dynapol, Palo Alto, Calif.

Filed May 8, 1974, Ser. No. 467,951

Int. Cl.² C08F 13/00, 27/04

U.S. Cl. 526—19 9 Claims

1. A solid polymeric organotin hydride compound of the formula



wherein P represents a porous crosslinked substantially organic solvent insoluble hydrocarbon polymer; R and R_1 each represent hydrogen, a lower alkyl group having from 1 to 5 carbon atoms, an aryl group having from 6 to 10 carbon atoms, or an aralkyl or alkaryl group having from 7 to 10 carbon atoms; and n is a positive value greater than 1.

3,975,335

SULPHURCURABLE POLYMER OF ETHYLENE AND AT LEAST ONE OTHER α-ALKENE WITH REDUCED COLD FLOW PROPERTIES

Meindert Tiessens, Beek (L), and Henricus J. M. Van Gorcom, Stein, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 821,959, May 5, 1969, abandoned. This application Aug. 2, 1971, Ser. No. 168,417

Claims priority, application Netherlands, May 3, 1968, 6806352

Int. Cl.² C08D 3/04, 1/14, 9/00

U.S. Cl. 526—283 1 Claim

1. Polymers composed of 20.0–74 % by weight of ethylene, 24 – 78 % by weight of one or more α-alkenes and at least 0.140 mole of dicyclopentadiene and 5-alkylidene norbornene-2 per 1000 g of polymer, the molar ratio of dicyclopentadiene to 5-alkenyl norbornene being lower than 1 : 6.

3,975,336

POLYMERS OF NONCONJUGATED 1,4-DIENES

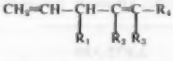
Joginder Lal, Akron, and Paul H. Sandstrom, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 360,239, May 14, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,408

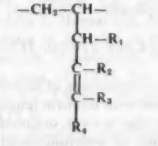
Int. Cl.² C08F 210/00, 212/00

U.S. Cl. 526—335 8 Claims

1. The compositions of matter comprising homopolymers and interpolymers of nonconjugated diolefins defined by the formula:



where R_1, R_2 and R_3 are from the group of hydrogen, a lower alkyl group containing up to 4 carbon atoms or an aryl group and R_4 is from the group of a lower alkyl group containing up to 4 carbon atoms or an aryl group, said polymers containing at least 50 mole percent of their repeat units of the structure.



where R_1, R_2, R_3 and R_4 are defined as before.

3,975,337

PROCESS FOR THE PRODUCTION OF ACRYLIC FIBERS PROCESSIBLE INTO YARNS WITH IMPROVED TEXTILE PROPERTIES AND LOW BOILING-INDUCED SHRINKAGE VALUES

Ulrich Reinehr; Alfred Nogaj, and Wolfhard Schmidt, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of Ser. No. 361,556, May 18, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,938

Claims priority, application Germany, Apr. 20, 1972, 2219218

Int. Cl.[2] C08F *220/42*; **D01F** *6/18*

U.S. Cl. 526—341 **2 Claims**

1. A process for the production of a polyacrylonitrile spun strand tow containing from 7 to 15% by weight of a copolymerized comonomer, which comprises reducing by 80 to 95% the original tow shrinkage emanating from the dry spinning and stretching process by:

1. stretching said dry spun tow in hot water at 80° to 100°C;
2. dry heat fixing said tow for 60 to 100 seconds at a temperature of 100° to 180°C;
3. eliminating subsequently the residual shrinkage to less than 5% by passage of saturated steam thereover at 110°-115°C and;
4. drying said tow at about 130°–140°C.

3,975,338

PROCESS OF PRODUCING VINYL CHLORIDE POLYMERS

Katsuya Tsubota, Osaka; Shigeru Motani, Settsu; Tatsuo Hasue, Toyonaka, and Yasuhiro Nijima, Settsu, all of Japan, assignors to Kanegafuchi Chemical Industries Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 370,263, June 15, 1973, abandoned. This application Dec. 21, 1973, Ser. No. 427,172

Claims priority, application Japan, June 30, 1972, 47-66056

Int. Cl.[2] C08F *1/13*, *3/30*, *15/30*

U.S. Cl. 526—345 **12 Claims**

1. In a method of producing a polyvinyl chloride paste resin which has improved thermal stability, improved stability to sol viscosity and good free and forced air release capability, wherein the polyvinyl chloride paste resin is produced by the polymerization of vinyl chloride, the improvement wherein the polymerization is conducted in the presence of an emulsifying agent which contains as a major component (1) components selected from the group consisting of alkali metal salts and ammonium salts of an olefin alkyl sulfonate and mixtures thereof, and as a minor component (2) a minor amount of a hydroxyalkyl sulfonate; both components (1) and (2) having from about 12 to 18 carbon atoms in the alkyl moiety; said emulsifying agent being produced by sulfonating an α-olefin having 12 to 18 carbon atoms, and then hydrolyzing the sulfonated product in the presence of an alkali.

9. The process as claimed in claim 1 wherein the emulsion polymerization is a seeded emulsion polymerization.

3,975,339

MANUFACTURE OF POLYMERS OF NET-SHAPED STRUCTURE

Walther Burchard, Gundelfingen, and Helmut Eschwey, Merzhausen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 9, 1974, Ser. No. 504,379

Claims priority, application Germany, June 10, 1974, 2427957

Int. Cl.[2] C08F *210/00*, *212/00*

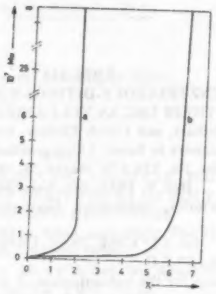
U.S. Cl. 526—347 **3 Claims**

1. A process for the manufacture of polymers of net-shaped crosslinked structure and with uniform length of crosslinks, by reaction of low molecular weight organoalkali metal compounds with bifunctional or polyfunctional coupling agents, wherein

I.

a. mixtures of divinylbenzene with monovinyl-aromatic compounds and having a divinylbenzene content of from 10 to 80% by weight and

b. low molecular weight organoalkali metal compounds with up to 50 carbon atoms in the organic radical are reacted with one another in an inert organic solvent, the content of divinylbenzene in the reaction mixture not exceeding 2.5 percent by weight, based on the reaction mixture, and the molar ratio of divinylbenzene



to the alkali metal content of the low molecular weight organoalkali metal compound being from 0.5 : 1 to 20 : 1, and thereafter

II. the polymeric polyfunctional organoalkali metal compounds thus obtained are reacted, with bifunctional or polyfunctional coupling agents such as divinylbenzene, diisopropenylbenzene, divinylanthracene, terephthalic acid dimethyl ester, methylene chloride and 1,2-dibromoethane in a molar ratio of coupling agent to alkali metal content of the polymeric polyfunctional organoalkali metal compound of less than 1:1.

3,975,340

POLYMERS AND TWO-COMPONENT SEALANT SYSTEMS

Kazuo Manaka, Broadview, Ill., assignor to Broadview Chemical Corporation, Broadview, Ill.

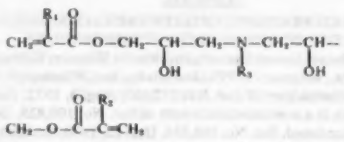
Division of Ser. No. 860,786, Sept. 24, 1969, Pat. No. 3,868,409. This application Mar. 22, 1974, Ser. No. 453,694

The portion of the term of this patent subsequent to Mar. 13, 1990, has been disclaimed.

Int. Cl.[2] C08F *120/36*

U.S. Cl. 526—312 **8 Claims**

1. A two-component sealant system which is shelf-stable before said components are combined, and which is capable of setting up on combination of said components, comprising: separate first and second components which, when mixed, form a polymer, said first component comprising an amine salt of a monomer characterized by the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl and R_3 is selected from the group consisting of lower alkyl and lower hydroxyalkyl, said amine salt being prepared by reacting said monomer with an acid selected from the group consisting of acrylic acid and lower alkyl acrylic acids; and said second component comprising a curing agent, said curing agent being selected from the group consisting of hydrogen peroxide, organic peroxides and organic hydroperoxides.

3,975,341

WATER IN OIL EMULSION PROCESS FOR PREPARING GEL-FREE POLYELECTROLYTE PARTICLES

Louis E. Trapasso, Watchung, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,668

Int. Cl.² C08F *120/52, 120/70, 122/30, 200/00*

U.S. Cl. 526—303 **14 Claims**

1. An inverse emulsion polymerization process for preparing polymer particles which form gel-free aqueous solutions which process comprises:

a. refluxing with vigorous agitation an azeotropic emulsion mixture consisting essentially of a major amount of oil and a minor amount of water and an emulsifier; and

b. continuously adding to the agitated, refluxing emulsion mixture an aqueous solution containing a polymerization initiator and at least about 50 percent by weight of the solution of at least one water-soluble, oil insoluble ethylenically unsaturated monomer adapted to polymerize under reflux conditions whereby the said monomer polymerizes essentially immediately in particulate form.

3,975,342

TYROSYL-CLASS ANTIGENIC CONJUGATES, THEIR PREPARATION AND ANTIBODIES RAISED THERETO

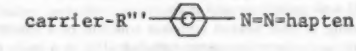
Stanley Joseph Gross, Encino, Calif., assignor to Biological Developments, Inc., Encino, Calif.

Continuation-in-part of Ser. No. 253,632, May 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 89,929, Nov. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 45,558, June 11, 1970, abandoned. This application Mar. 18, 1974, Ser. No. 451,812

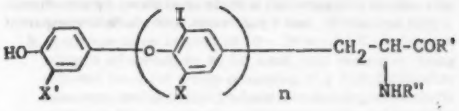
Int. Cl.² A61K *37/00;* **C07C** *103/52;* **C07G** *69/36;* **G01N** *31/00*

U.S. Cl. 260—112 R **21 Claims**

1. A synthetic antigen of formula:



wherein the carrier is selected from the class consisting of proteins and synthetic proteins, and confers antigenicity, R''' is coupled to the carrier through a reactive group, the residue being substantially non-reactive, R''' being bonded to the aryl with up to three bonds, being substituted or unsubstituted, and having up to four rings and up to 20 aliphatic carbon atoms; and the hapten has the formula:



where R' is selected from the group consisting —OH and —NHP_p, and R'' is selected from the class consisting of —H and —COP_p, where P_p is a polypeptide chain having from 1 to 250 peptide groups, with or without pendant groups; X is selected from the class consisting of H and I; X' is selected from the class consisting of H and I when X is I; *n* is 0 or 1 and X' is H when *n* is 0; bonding of the hapten to the diazo group being according to the direction of the ring members and substituents.

19. A method for forming a synthetic antigen from a carrier selected from the class consisting of proteins and synthetic proteins, said carrier having an available reactive group for coupling thereto, a hapten having a reactive group selected from the class consisting of amino and carboxyl, and a carbon atom susceptible to diazonium coupling, and a primary aromatic amine compound having a reactive residue capable of coupling to the reactive group on the carrier, wherein the carrier reactive group and the primary amine compound reactive residue consist of a carboxyl group and an amino group, whereby the carrier can be coupled to the primary amine compound by an amide group, the method comprising:

a. conjugation of the primary aromatic amine compound with the carrier to form an amide bond;

b. treatment of the conjugated primary aromatic amine compound to provide for bonding of the hapten by formation of diazonium ion; and

c. coupling of the hapten to the conjugated diazonium ion.

3,975,343

SOLUBILIZATION OF PROTEIN WITH ETHANOL-ACETONITRIL-WATER SOLVENT SYSTEM

Thomas J. Jacks, Metairie, La.; Robert H. Barker, Easley, S.C., and Thomas P. Hensarling, Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

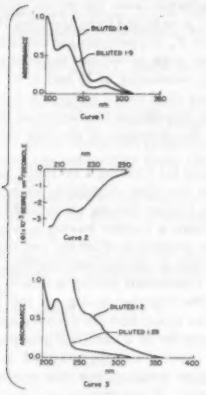
Filed June 27, 1975, Ser. No. 591,251

Int. Cl.² C07G *7/00;* **G01N** *33/16*

U.S. Cl. 260—112 R **4 Claims**

1. A process for dissolving membrane proteins of biological origin comprising mixing about 1.4 mg of membrane with 1 ml

of a solvent mixture which is made up of about 4 parts ethanol, 1 part acetonitrile, and 1 part water, and which is transparent



to ultraviolet and visible radiation in the spectrum of about from 200 to 400 namometers.

3,975,344

INTERFERON PURIFICATION

Alan Asher Schwartz, Winnetka, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Oct. 2, 1974, Ser. No. 511,451

Int. Cl.² A61K *45/02*; **C07G** *7/00*

U.S. Cl. 260—112 R **8 Claims**

1. A method for the purification of interferon or interferon-like proteins isolated from animal cells which comprises subjecting crude interferon or interferon-like proteins isolated from animal cells to zonal density gradient centrifugation.

3,975,345

POLYAMIDEIMIDES AND METHOD FOR MAKING

William A. Fessler, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 23, 1972, Ser. No. 265,534

Int. Cl.² C08J *3/00*; **C08L** *77/10*

U.S. Cl. 260—29.2 N **2 Claims**

1. An electrocoating composition comprising (1) polyamide acid, (2) water, (3) organic solvent and a sufficient amount of (4) base to provide about 0.05 to about 1 meq of base per/gram of polymer, where said polyamide acid is the product of reaction of a polyamideimide and a base having an ionization constant greater than 10^{-2} in water at 25°C in the presence of an aprotic organic solvent for the polyamideimide, which is the reaction product of toluene diisocyanate and the dicarboxylic acid reaction product of two moles of trimellitic anhydride, per mole of organic diamine, where in forming the polyamideimide toluene diisocyanate is utilized in an amount at least sufficient to provide a substantially stoichiometric equivalence between isocyanate and carboxy of the dicarboxylic acid reaction product.

3,975,346

BORON-CONTAINING, QUATERNARY AMMONIUM SALT-CONTAINING RESIN COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 277,697, Aug. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 100,825, Dec. 22, 1970, abandoned, Ser. No. 100,834. Dec. 22, 1970, abandoned, Ser. No. 129,267, Mar. 29, 1971, abandoned, Ser. No. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470 is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, Ser. No. 840,848, July 10, 1969, abandoned, and a continuation-in-part of said Ser. No. 100,825 and Ser. No. 100,834, said Ser. No. 100,825 and Ser. No. 100,834 are in turn a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of said Ser. No. 772,366.

This application Apr. 25, 1974, Ser. No. 464,089

Int. Cl.² C08G *30/16*, *51/24*

U.S. Cl. 260—29.2 EP **20 Claims**

10. An aqueous dispersion suitable for use in electrodeposition comprising:

A. an essentially epoxy group-free, quaternary ammonium salt-containing resin comprising the ungelled reaction product of:

1. an organic epoxide having a 1,2-epoxide equivalent of at least about 1, and
2. an amine acid salt,
   i. said amine acid salt reacted with the organic epoxide at at least room temperature, said temperature being sufficient to form quaternary ammonium salt groups,
   ii. said amine acid salt reacted with said organic epoxide in an amount sufficient to form quaternary ammonium salt groups and an essentially epoxy group-free composition, this being accomplished by reacting at least a stoichiometric amount of amine salt with the organic epoxide, or by post reacting the organic epoxide-amine salt reaction product to remove residual epoxy groups; and

B. boric acid.

3,975,347

LINEAR DIMETHYLAMINE-EPICHLOROHYDRIN COPOLYMER

K. G. Phillips, River Forest, and W. E. Zarnecki, Worth, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 11, 1974, Ser. No. 522,381

Int. Cl.² C08J *3/02*; **C08L** *63/00*

U.S. Cl. 260—29.2 EP **6 Claims**

1. A process for the preparation of a 60 to 85% aqueous solution of a substantially linear polymer of a lower aliphatic secondary amine containing 2 to 8 carbon atoms having one amino group with an epihalohydrin said process comprising the steps of:

A. Heating a 50 to 90% aqueous solution of said lower aliphatic secondary amine to a temperature of 75°C to 95°C with agitation; and then,

B. Adding to said heated aqueous solution of a lower aliphatic secondary amine an epihalohydrin in a mole ratio of epihalohydrin to secondary amine from 0.75:1 to 1:1 at a rate sufficient to maintain the reaction temperature between 75°C to 95C with agitation whereby the concentration of the amine and epihalohydrin is from 60 to 85% by weight in an aqueous solution, and then,

C. Recovering said 60 to 85% solution of a substantially linear polymer of a lower aliphatic secondary amine and an epihalohydrin.

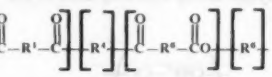
3,975,348
WATER-EXTENDED POLYESTERAMIDE RESINS AND METHODS FOR THEIR PRODUCTION

Ray C. Christena, Wichita, Kans., assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Dec. 7, 1973, Ser. No. 422,862
Int. Cl.² C08L *67/06*
U.S. Cl. 260—29.6 NR **7 Claims**

1. A stable water-in-oil emulsion consisting essentially of a polyesteramide resin as the continuous phase and water as the discontinuous phase, the polyesteramide resin having a polymer backbone consisting essentially of repeating units having recurring ester and amide linkages between the units and wherein the polyesteramide consists essentially of at least one member selected from the group consisting of

A. polyesteramides consisting essentially of repeating units represented by the structural formula



wherein:

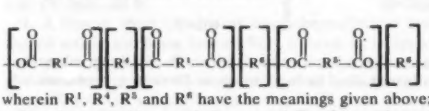
R^1 is a divalent radical selected from the group consisting of alkylene, cycloalkylene, cycloalkenylene, arylene, and aralkylene, wherein one or more of the hydrogen atoms thereof can be substituted by F, Cl, Br, lower alkyl and/or lower alkoxy;

R^4 is aminoalkyleneoxy or oxyalkyleneamine;

R^5 is alpha-beta ethylenicaly unsaturated alkenylene; and

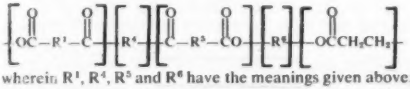
R^6 is alkylene,

B. polyesteramide consisting essentially of repeating units represented by the structural formula



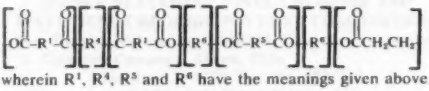
wherein R^1, R^4, R^5 and R^6 have the meanings given above;

C. polyesteramides consisting essentially of repeating units represented by the structural formula



wherein R^1, R^4, R^5 and R^6 have the meanings given above; and

D. polyesteramides consisting essentially of repeating units represented by the structural formula



wherein R^1, R^4, R^5 and R^6 have the meanings given above.

3,975,349
PROCESS FOR PREPARING DIALLYL PHTHALATE LATEX

Akio Suzui, Amagasaki; Hiroshi Yoshimoto, Ibaraki, and Takeshi Kuri, Kobe, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Jan. 13, 1975, Ser. No. 540,441
Claims priority, application Japan, Sept. 6, 1974, 49-103208
Int. Cl.² C08L *45/00*
U.S. Cl. 260—29.7 R **7 Claims**

1. A process for preparing a diallyl phthalate latex which comprises using in proportions of a total of 30 – 100 weight parts of monomer and a total of 0.3 – 10.0 weight parts of an anionic surfactant derived from a nonionic surfactant to a total of 100 weight parts of water, and (I) carrying out an emulsion polymerization using an emulsion polymerization system containing a mixture of

a. water in an amount of 50 – 70 weight % of the total amount of water to be used,

b. monomer in an amount of 10 – 20 weight % of the total amount of monomer to be used, said monomer being selected from the group consisting of a diallyl phthalate monomer and a diallyl phthalate-containing monomeric mixture wherein at least one member is selected from the group consisting of alkyl acrylate having 1–8 carbon atoms, alkyl methacrylate having 1–8 carbon atoms or a mixture thereof contained in a mole ratio to diallyl phthalate of not more than 3:1, and

c. said surfactant in an amount of 10 – 20 weight % of the total amount of surfactant to be used; and

II. adding at one time the entire amount of a radical catalyst; and then

III. at a period after the degree of polymerization has reached at least 50 weight % and before completion of the polymerization, continuing the emulsion polymerization reaction while adding an additional emulsion polymerization system containing the following components and without said radical catalyst:

a. water remaining of the total amount to be used,

b. monomer remaining of the total amount to be used, and

c. said surfactant remaining of the total amount to be used.

3,975,350
HYDROPHILIC OR HYDROGEL CARRIER SYSTEMS SUCH AS COATINGS, BODY IMPLANTS AND OTHER ARTICLES

Donald Edward Hudgin, Princeton Junction, and Edgar Allan Blair, Cranbury, both of N.J., assignors to Princeton Polymer Laboratories, Incorporated, Plainsboro, N.J.

Continuation-in-part of Ser. No. 277,361, Aug. 2, 1972, Pat. No. 3,822,238. This application June 25, 1974, Ser. No. 482,874
The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.
Int. Cl.² C08G *18/48, 18/30, 18/32;* **A61F** *1/00*
U.S. Cl. 260—30.4 N **23 Claims**

1. A carrier system comprising an active agent and a hydrophilic polymer as a carrier vehicle therefor, said carrier vehicle comprising a crosslinked polyurethane polymer consisting essentially of

A. as a resin precursor of said polyurethane polymer, a polyfunctional resin having an equivalent weight of more than 170 and up to 2000 and a numerical carbon to oxygen or carbon to nitrogen ratio of up to 2.5:1 to 1.2:1 or a numerical carbon to ionic group ratio in said resin of 20:1 to 6:1, said resin being selected from the class consisting of:

1. an adduct of

a. a dihydroxy compound with propylene imine, ethylene oxide, propylene oxide, ethylene imine, dioxolane or mixtures of same;

b. a trihydroxy compound with ethylene oxide, propylene oxide, ethylene imine, propylene imine, dioxolane or mixtures of same;

c. a tetrahydroxy compound with ethylene oxide, propylene oxide, ethylene imine, propylene imine, dioxolane or mixtures of same;

d. a polyhydroxy compound of more than 4—OH groups with ethylene oxide, propylene oxide, ethylene imine, propylene imine, dioxolane or mixtures of same;

e. a hydroxy carboxylic acid or a sugar acid with ethylene oxide, propylene oxide, ethylene imine, propylene imine, dioxolane or mixtures of same;

f. low molecular weight, hydrolyzed polyvinyl acetate, polyacrylic acid or polymethacrylic acid with ethylene oxide, ethylene imine, dioxolane or mixtures of same;

2. an adduct of trimellitic acid, orthophosphoric acid, pyromellitic acid, or mellitic acid with ethylene oxide,

propylene oxide, ethylene imine, dioxolane or mixtures of same;

3. an adduct of pyrophosphoric acid with ethylene oxide, propylene oxide, ethylene imine, propylene imine, dioxolane or mixtures of same;

4. an adduct of ammonia or a polyamino compound with ethylene oxide, propylene oxide, ethylene imine, propylene imine, dioxolane or mixtures of same;

5. an ammonium or quaternary ammonium salt of said adduct of ammonia or a polyamino compound;

6. a sulfonated reactive-H group terminated polyester resin of a maleic acid ester, itaconic acid ester, fumaric acid ester, mesoconic acid ester or citraconic acid ester wherein a dihydroxy compound precursor of said ester is a glycol of 2 to 6 carbon atoms;

7. a reactive-H group terminated polyester amide of a lower alkyl dialkanol amine and a diacid wherein said acid is adipic acid, sebacic acid, azelaic acid, maleic acid, phthalic acid, fumaric acid, itaconic acid, mesoconic acid, citraconic acid, and an ammonium or quaternary ammonium compound of said amine groups;

8. a reactive-H group terminated linear of slightly branched polyamide wherein the amine precursor of said amide is diethylene triamine, triethylene tetramine, tetraethylene pentamine, a polyloweralkylene imine, and the acid precursor of said amide is adipic, sebacic, maleic, azelaic, phthalic, itaconic, mesoconic, or citraconic, an amine salt or mixtures of same, a hydrammonium quaternary ammonium compound thereof, or an adduct of said amide with ethylene oxide, ethylene glycol, dioxolane or propylene glycol;

9. a reactive-H group terminated polysulfhydryl resin having in the backbone thereof sulfonium, sulfoxide, or sulfone groups; and

10. mixtures of above resins;

B. as a urethane linkage precursor of said polyurethane polymer, an aliphatic, alicyclic-aliphatic, mixed aliphatic-aromatic or an aromatic polyfunctional isocyanate, a nitrile carbonate or mixtures of same of a functionality of 2 or higher in an amount from 0.02 in excess of one equivalent weight of isocyanante times its functionality per equivalent weight of resin times its functionality up to equi-equivalent weight of said isocyanate to said resin.

3,975,351

PLASTICIZERS AS ADHESION PROMOTERS IN POLYESTER/POLYAMIDE HETEROFILAMENTS

Sylvia Etchells, Pontypool, England, assignor to Imperial Chemical Industries Inc., London, England

Continuation of Ser. No. 886,783, Dec. 19, 1969, abandoned. This application Jan. 27, 1972, Ser. No. 221,419

Int. Cl.[2] C08K *5/06, 5/12, 5/17, 5/42*

U.S. Cl. 260—30.8 R **18 Claims**

1. A process for improving adhesion between heterofilament components of polyester and polyamide, which components are normally nonadhesive to the other component of said heterofilament comprising modifying at least one component of said heterofilament by adding a plasticizer to said component in an amount up to 15 percent by weight of said component prior to extruding said component into said heterofilament configuration.

3,975,352

REPELLENT COMPOSITIONS AND ELEMENTS CONTAINING THE SAME

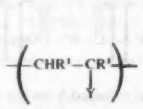
William E. Yoerger, Rochester; John M. McCabe, Pittsford, and John F. Wright, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 497,348, Aug. 13, 1974, Pat. No. 3,901,700, which is a division of Ser. No. 361,370, May 17, 1973, Pat. No. 3,859,090. This application Mar. 13, 1975, Ser. No. 558,030

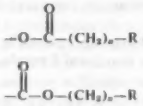
Int. Cl.[2] C08K *5/02, 5/54*

U.S. Cl. 260—33.8 F **6 Claims**

1. A repellent composition comprising from about 1 to about 40 percent by weight of an oil of low volatility having a surface energy of less than about 27 dynes/cm selected from the group consisting of fluorinated oils and poly(siloxane) oils and from about 5 to about 98 percent by weight of a solid fluorinated polymer having repeating units of the following formula:



wherein R^1 represents hydrogen or an alkyl group having 1 to about 4 carbon atoms and wherein Y represents a moiety having one of the following formulas:



wherein R is a fluorinated alkyl or a fluoroalkoxy substituted fluorinated alkyl having 1 to about 20 carbon atoms and *n* is 0 or 1.

3,975,353

THERMOSETTING MOULDING COMPOSITIONS

Alan Crowe, Dinas Powis, and David Philip Fry, Llanishen, both of Wales, assignors to PB Chemicals International Limited, England

Filed May 15, 1972, Ser. No. 253,149

Claims priority, application United Kingdom, May 20, 1971, 15982/71

Int. Cl.[2] C08G *63/76;* **C08K** *3/40*

U.S. Cl. 260—40 R **6 Claims**

1. An unsaturated polyester resin composition for sheet moulding compounds comprising (1) an unsaturated polyester, (2) a copolymerisable monomer, (3) 2 to 15 parts by weight per 100 parts by weight of the combined weight of said unsaturated polyester and copolymerisable monomer of a saturated liquid polyester and (4) 4 to 15 parts by weight per 100 parts by weight of the combined weight of said unsaturated polyester and copolymerisable monomer of a thermoplastic polymer consisting essentially of polymerised caprolactone units.

3,975,354
GLASS FIBER-REINFORCED FLAME-RESISTANT THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS CONTAINING POLY(2,4,6-TRIBROMOSTYRENE)

Lothar Buxbaum, Lindenfels, and Franz Breitenfellner, Bensheim, both of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,124

Claims priority, application Switzerland, Dec. 17, 1973, 17661/73

Int. Cl.² C08G *39/02*

U.S. Cl. 260—40 R **12 Claims**

1. A flame-resistant thermoplastic glass fibre-reinforced polyester moulding composition which contains a saturated polyester and, optionally, synergistic substances, characterised in that 3 to 30% by weight of poly(2,4,6-tribromostyrene), relative to the total composition, are admixed.

3,975,355
FILMS AND SHEETS OF POLYESTER-POLYCARBONATE BLENDS

Philip Stuart Bolen, Auburn, and Surendra A. Amin, Pottsville, both of Pa., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Feb. 24, 1975, Ser. No. 552,496

Int. Cl.² C08L *67/02*

U.S. Cl. 260—40 R **20 Claims**

1. A film or sheet capable of being thermoformed into a shaped article and being formed from a blend of, in approximate parts by weight, 60 to 85 parts of a polyethylene terephthalate having an intrinsic viscosity of at least about 0.90, 15 to 40 parts of polycarbonate and 5 to 20 parts of a non-acidic silica filler, the polyethylene terephthalate fraction of said film or sheet having a degree of crystallinity in the range of about 20 to 40%.

3,975,356
SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer Douglas Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 2, 1975, Ser. No. 582,730

Int. Cl.² C08K *3/30, 3/28, 3/24, 5/32*

U.S. Cl. 260—45.7 S **26 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of NiI_2, $NiMoO_4$, NiO and nickel dimethylglyoxime, and (B) at least one aluminum compound selected from the group consisting of α-Al_2O_3, $Al_2(WO_4)_3$, and aluminum salicylate, said compounds (A) and (B) being present in a total amount from about 0.25 to about 100 weight parts per 100 weight parts of polymer.

22. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of NiI_2, NiO and nickel dimethylglyoxime, and (B) at least one aluminum compound selected from the group consisting of $Al_2(MoO_4)_3$ and ammonium-6-molybdoaluminate (III), said compounds (A) and (B) being present in a total amount from about 0.25 to about 100 weight parts per 100 weight parts of polymer.

3,975,357
STABILIZED SYNTHETIC POLYMER COMPOSITIONS

Keisuke Murayama; Syoji Morimura, and Takao Yoshioka, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

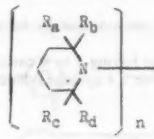
Filed Apr. 5, 1974, Ser. No. 458,438

Claims priority, application Switzerland, Apr. 19, 1973, 5753/73; Japan, Jan. 26, 1974, 49-11128

Int. Cl.² C08K *5/15, 5/34*

U.S. Cl. 260—45.8 N **8 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



(I)

wherein

n represents 1 or 2,

R_a, R_b, R_c and R_d represent a methyl group, and

R_1 represents, when $n = 1$,

an alkyl group having 4 to 12 carbon atoms;

an alkenyl group having 3 to 10 carbon atoms;

an alkynyl group having 3 or 4 carbon atoms;

a benzyl group optionally substituted with 1 to 3 substituents, which may be the same or different, selected from chlorine, an alkyl having 1 to 4 carbon atoms, an alkoxy having 1 to 8 carbon atoms and hydroxy in its phenyl moiety; phenethyl group;

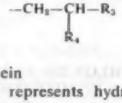
2,3-epoxypropyl group; or a group of the formula

$$-CH_2-CO.O-R_2,$$

wherein

R_2 represents an alkyl group having 1 to 18 carbon atoms, an alkenyl group having 3 to 6 carbon atoms, phenyl group, benzyl group, cyclohexyl group or 2,3 epoxypropyl group; or

a group of the formula



wherein

R_3 represents hydrogen atom, methyl group or phenyl group;

R_4 represents a hydroxy group or a group of the formula $-O.COR_5$;

R_5 represents an alkyl group having 1 to 17 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, a phenyl group optionally substituted with 1 to 3 substituents, which may be the same or different, selected from chlorine, an alkyl having 1 to 4 carbon atoms, an alkoxy having 1 to 8 carbon atoms and hydroxy, benzyl group, 3,5-di-tertiary butyl-4-hydroxyphenethyl group, styryl group or cyclohexyl group; or R_1 may be a group of the formula

$$-CO-R_6,$$

wherein

R_6 represents a hydrogen atom, methyl group, an alkenyl group having 2 or 3 carbon atoms, an alkoxy group having 1 to 8 carbon atoms, benzyloxy group or phenoxy group;

and when $n = 2$,

R_7 represents an alkylene group having 1 to 6 carbon atoms in which the alkylene chain may optionally be interrupted by an oxygen atom; 2-butenylene group; or a group of the formula

$$-CH_2CO\cdot O-R_7-O-COCH_2-,$$

wherein

R_7 represents an alkylene group having 2 to 6 carbon atoms or xylylene group; or a group of the formula

$$-CH_2\cdot CH_2-O\cdot CO\leftarrow R_8\rightarrow_m CO\cdot O-CH_2\cdot CH_2-$$

wherein

m represents 0 or 1;

R_8 represents an alkylene group having 1 to 10 carbon atoms in which

the alkylene chain may optionally be interrupted by a sulfur atom;

an alkenylene group having 2 to 4 carbon atoms,

a phenylene group or 1,4-cyclohexylene group.

3,975,358

POLYMERS STABILIZED WITH AN ORGANO-NICKEL COMPOUND AND A DIALKYL PENTAERYTHRITOL DIPHOSPHITE

Joseph Anthony Stretanski, Clinton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 26, 1972, Ser. No. 247,640

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 N 10 Claims

1. A polymer subject to degradation on exposure to ultraviolet radiation stabilized against degradation on exposure to ultraviolet radiation by an effective amount of a nickel amine, nickel aquo, or nickel bis- complex of 2,2′-thiobis(p-alkylphenol) wherein each alkyl group has up to 18 carbon atoms and further stabilized against thermal degradation of said complex on exposure to heat by an effective amount of a dialkyl pentaerythritol diphosphite wherein each alkyl group has 6 to 20 carbon atoms said polymer being selected from the group consisting of polyolefins, acrylonitrile-butadiene-styrene polymers, polystyrene, polycarbonates, and polyamides.

3,975,359

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer D. Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1974, Ser. No. 537,173

Int. Cl.² C08K 3/10, 3/38, 3/32, 3/30, 3/18

U.S. Cl. 260—45.75 A 35 Claims

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiCl_2$, $NiCO_3$, $NiMoO_4$, NiO, Ni_2O_3, NiS, $NiSO_4$, $NiWO_4$, nickel citrate and nickel formate, and (B) at least one bismuth compound selected from the group consisting of $BiBO_3$, Bi_2O_3, $Bi_2O_2CO_3$ and Bi_2S_3, said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

18. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a compound selected from the group consisting of NiB_2, $NiCO_3$, $NiCrO_4$, $NiFe_2O_4$, $Ni_3(PO_4)_2$, NiS, $NiSnO_3$, $NiSO_4$, $NiWO_4$, nickel citrate, $BiBO_3$, $Bi_2O_2CO_3$ and $BiPO_4.3H_2O$, said compound being present in an amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

3,975,360

AGE RESISTERS FOR OXIDIZABLE POLYMERS

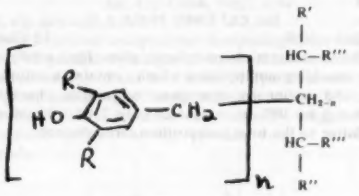
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 20, 1974, Ser. No. 534,609

Int. Cl.² C08J 3/20; C07C 69/76

U.S. Cl. 260—45.85 R 13 Claims

1. Compositions of matter conforming to the structural formula



where n is an integer from 1 to 2, R is selected from the group consisting of tertiary alkyl radicals having from 4 to 8 carbon atoms, R′ and R″ are selected from the group consisting of hydrogen atom and methyl radical and R‴ is selected from the group consisting of the radicals —OH and —OCOR⁗ where R⁗ is selected from the group consisting of alkyl radicals having from 1 to 4 carbon atoms.

3,975,361

PROCESS FOR THE PREPARATION OF POLYVINYL CHLORIDE FOAMS

Guy Poy, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

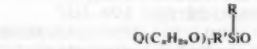
Filed July 31, 1974, Ser. No. 493,458

Claims priority, application France, Aug. 1, 1973, 73.28211

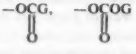
Int. Cl.² C08G 77/04

U.S. Cl. 260—46.5 R 8 Claims

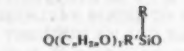
1. An organosilicon copolymer comprising units of the general formulae $(CH_3)_2RSiO_{0.5}$ and



and SiO_2, wherein R represents an alkyl group with 1 to 3 carbon atoms or a vinyl group, R′ represents a divalent hydrocarbon radical with 1 to 10 carbon atoms, Q represents an organic radical of the formulae —OG,



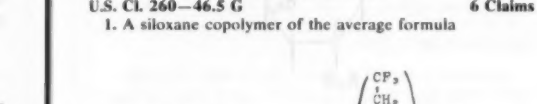
or $-OSiR_3$ in which G represents an alkyl radical with 1 to 4 carbon atoms and each R group, which may be identical or different, is as defined above, n represents 2, 3 or 4, the C_xH_{2x} group being straight or branched and y represents a number from 4 to 60; the C_xH_{2x} groups being the same or different, the ratio of the number of $(CH_3)_2RSiO_{0.5}$ units to the number of SiO_2 units being 0.55:1 to 0.75:1 and the ratio of the number of



units to the number of SiO_2 units being 0.005:1 to 0.1:1.

3,975,362
LOW TEMPERATURE REVERSION RESISTANT ORGANOSILICON POLYMERS
Yung K. Kim, and Michael O. Riley, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Apr. 28, 1975, Ser. No. 572,583
Int. Cl.² C08G 77/04
U.S. Cl. 260—46.5 G **6 Claims**

1. A siloxane copolymer of the average formula

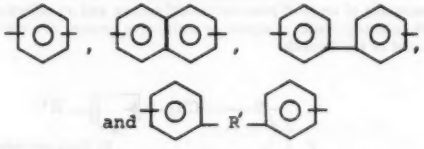


in which
R and R′ are independently methyl or $CF_3CH_2CH_2$—,
R_f is a perfluoroalkylene radical of 2 to 10 carbon atoms,
n has an average value of from 1 to 2, and
m has an average value of at least 1.

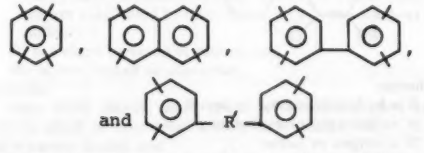
3,975,363
POLY(DIELS-ALDER) POLYMER
Robert J. Jones, Hermosa Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Continuation of Ser. No. 411,515, Oct. 31, 1973, abandoned. This application Feb. 14, 1975, Ser. No. 550,080
Int. Cl.² C08G 69/48, 73/12
U.S. Cl. 260—47 UA **2 Claims**

1. An aromatic polymer consisting essentially of the structure:

wherein R is an aromatic radical selected from the group consisting of difunctional radicals having the structure:

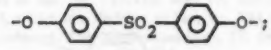


and tetrafunctional radicals having the structure:

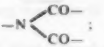


wherein R′ is —O—, —S—, $-SO_2$—, —CO—, $-CH_2$—, $-C_2H_4$—, $-C_3H6$—,

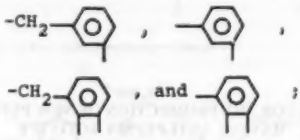
and



X is selected from the group consisting of —NH—CO— and



E is selected from the group consisting of



and *n* is an integer from 3 to 100.

3,975,364
HALOGENATED ESTERS OF ALIPHATIC DICARBOXYLIC ACIDS
Kenneth Rowland Dobson, Epsom Downs, England, assignor to BP Chemicals International Limited, England
Continuation-in-part of Ser. No. 387,951, Aug. 13, 1973, Pat. No. 3,890,375. This application Feb. 10, 1975, Ser. No. 548,557
Claims priority, application United Kingdom, Aug. 25, 1972, 39644/72
Int. Cl.² C07C 69/34, 69/40
U.S. Cl. 260—485 H **8 Claims**

1. An ester of a linear C_8 alcohol of the general formula:

$$Z(CH_2)_3.Z^1.CH_2.O.CO.R.Y$$

or

$$Z(CH_2)_2.CH(Z).O.CO.R.Y$$

wherein

Z is $XCH_2.CHX$-,

Z^1 is -CHX.CHX-,

X is Cl or Br,

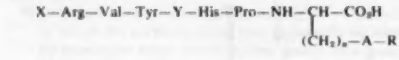
R is a divalent saturated aliphatic hydrocarbon radical which may be substituted by halogen or alkyl, or a direct bond, and

Y is lower alkyl.O.CO-,

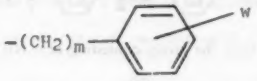
$$Z(CH_2)_2.Z^1.CH_2.O.CO \text{ or } Z(CH_2)_2.\underset{\displaystyle Z}{CH}.O.CO.$$

3,975,365
INHIBITORY OCTAPEPTIDES ANGIOTENSIN II
Robert H. Mazur, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
Filed Jan. 27, 1975, Ser. No. 544,128
Int. Cl.² C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 R **14 Claims**

1. A compound of the formula



wherein X represents a sarcosine or aspartic acid residue, Y represents the residue of isoleucine or valine, *n* is 1, A is O, S, SO, SO_2, and R is arylalkyl of the formula



wherein *m* is 1 or 2, *w* is hydrogen, halo, loweralkyl having 1–7 carbon atoms, or loweralkoxy having 1–7 carbon atoms, and the amino acid residues having L or DL stereochemical configuration.

3,975,366

PROCESS FOR THE PRODUCTION OF NEW PEPSTATINS HAVING ANTI-PEPSIN ACTIVITY

Hamao Umezawa, Tokyo; Tetsuji Miyano, Nagoya; Kohtaro Funaishi, Okazaki; Tomio Takeuchi, Tokyo, and Takaaki Aoyagi, Fujisawa, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

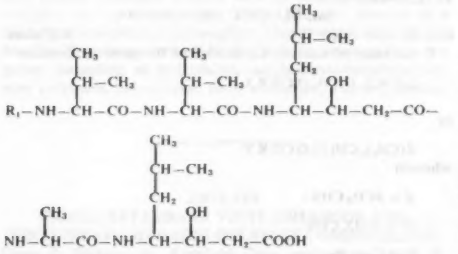
Division of Ser. No. 387,139, Aug. 9, 1973, Pat. No. 3,869,347, which is a continuation-in-part of Ser. No. 233,533, March 10, 1972, abandoned. This application Feb. 4, 1975, Ser. No. 547,083

Claims priority, application Japan, Mar. 26, 1971, 46-17292

Int. Cl.² C07C *103/52*; C08H *1/00*

U.S. Cl. 260—112.5 R **1 Claim**

1. A compound having the formula:



wherein R_1 is n-caproyl or an alkyl ester thereof wherein the alkyl group contains 1–4 carbon atoms.

3,975,367

ARABINOFURANOSYL N⁴-AMINOACYL CYTOSINE CONTAINING COMPOUNDS

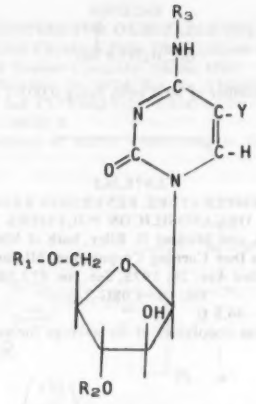
Duane T. Gish, Portage; Gary D. Gray, Pavilion Township, Kalamazoo County, and William J. Wechter, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 150,918, June 8, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 501,886

Int. Cl.² C07C *103/52*; C07H *19/06*, *19/08*

U.S. Cl. 260—112.5 R **12 Claims**

1. The compounds 1-(3′-O-Variable- and 5′-O-Variable-β-D-arabinofuranosyl)-N⁴-(α-aminoacyl)cytosines of the formula:



wherein R_1 and R_2 are hydrogen, or an acyl group comprising up to 21 carbon atoms, inclusive; Y is hydrogen, halogen, or alkyl-, hydroxyalkyl-, or haloalkyl of from 1 to 4 carbon atoms, inclusive; and R_3 is an α-aminoacyl group consisting of a single α-amino acid or up to 10 α-aminoacids linked as peptides, including acid addition salts thereof.

3,975,368

PHARMACEUTICAL COMPOSITIONS CONTAINING AN N-(FURYL- OR THIENYL-METHYL)-DESOXY-NORMORPHINE OR NORCODEINE AND METHOD OF USE

Gerhard Walther; Herbert Merz; Adolf Langbein, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

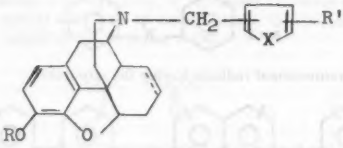
Division of Ser. No. 396,171, Sept. 11, 1973, Pat. No. 3,928,359. This application Oct. 8, 1975, Ser. No. 620,847

Claims priority, application Germany, Sept. 14, 1972, 2245141

Int. Cl.² A61K *31/485*

U.S. Cl. 424—260 **12 Claims**

1. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective opiate-antagonistic, analgesic or antitussive amount of a compound of the formula



wherein

R is hydrogen, methyl or acetyl,

R′ is hydrogen or methyl, and

X is oxygen or sulfur,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,975,369

2:1 METAL COMPLEXES OF 2,2',4'-TRIHYDROXY-3,5-DINITROAZOBENZENE BOUND TO A DIPHENYLAMINE THROUGH AN AZO BRIDGE

Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 60,748, Aug. 3, 1970, Pat. No. 3,787,387. This application Nov. 28, 1973, Ser. No. 419,509

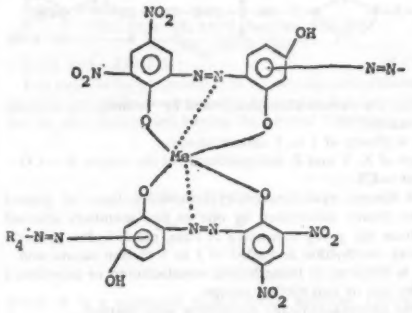
Claims priority, application Switzerland, Nov. 15, 1973, 16103/73; Aug. 7, 1969, 11976/69

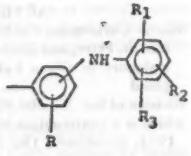
The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.

Int. Cl.² C09B 45/22, 45/32; D06P 1/10, 3/00

U.S. Cl. 260—145 B 17 Claims

1. A dye of the formula





wherein each of

R, R_1, R_2 and R_3 is independently hydrogen, halo, nitro, alkyl, alkyl substituted by halo, hydroxy or cyano, alkoxy, alkoxy substituted by halo, hydroxy or cyano, carboxy or sulfo,

R_4 is a diazo component radical, and

Me is iron, cobalt or chromium,

wherein

each alkyl, alkoxy, alkyl chain of substituted alkyl and alkoxy chain of substituted alkoxy independently has 1, 2, 3 or 4 carbon atoms, and

each halo is independently fluoro, chloro or bromo.

3,975,370

METHYLOLATED REACTION PRODUCT OF A HYDROXY CARBAMATE AND CELLULOSE-DYEING DYESTUFF CONTAINING VINYL SULFONE GROUPS

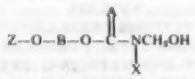
Russell M. H. Kullman, Metairie, and Robert M. Reinhardt, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 143,168, May 13, 1971, Pat. No. 3,873,513, which is a division of Ser. No. 791,697, Aug. 6, 1968, abandoned. This application Sept. 17, 1974, Ser. No. 506,933

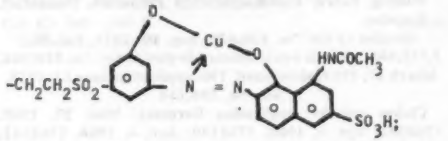
Int. Cl.² C09B 45/18, 62/08, 62/82

U.S. Cl. 260—151 2 Claims

1. A dyestuff having the formula

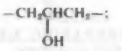


wherein Z is the chromophoric radical

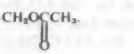


B is $-CH_2CH_2-$,

$-CH_2CH_2CH_2-$, or



A is —O— or —S—; and X is —H, $-CH_2OH$, $-CH_2OCH_3$, or



3,975,371

AROMATIC AZO SULFONYLNITRENE COMPOUNDS

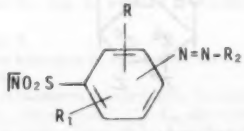
Daniel Lednicer, Portage, and Edward E. Nishizawa, Schoolcraft, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 258,016, May 30, 1972, Pat. No. 3,888,833. This application Mar. 17, 1975, Ser. No. 559,303

Int. Cl.² C07C 107/04, 107/06

U.S. Cl. 260—198 3 Claims

1. A compound of the formula



wherein R and R_1 are the same or different and are selected from the group consisting of hydrogen, halogen, and alkyl from one to four carbon atoms, inclusive, and R_2 is a substance which inhibits thrombogenic or clotting activity of a material and is that portion of a substituted aromatic which couples with a diazonium salt.

3,975,372
PREPARATION OF 12,13-DESEPOXY-12,13-DEHYDROROSAMICIN

Ashit K. Ganguly, Upper Montclair, and Olga Sarre, Verona, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 28, 1975, Ser. No. 554,266
Int. Cl.² C07H *17/08*
U.S. Cl. 536—17 **7 Claims**

1. A process for converting rosamicin into 12,13-desepoxy-12,13-dehydrorosamicin which comprises reducing rosamicin in a dilute mineral acid solution under an inert atmosphere containing as the reducing agent chromous ions derived from the chromous salt of a mineral acid.

3,975,373
CARDIOGLYCOSIDE DERIVATIVES OF THE STROPHANTHIDIN TYPE, A PROCESS FOR THEIR MANUFACTURE AND MEDICINAL PREPARATIONS CONTAINING THESE COMPOUNDS

Kurt H. Schmidt, Hildesheim, Germany, assignor to Johann A. Wulfing Fabrik Pharmazeutischer Praparate, Dusseldorf, Germany

Division of Ser. No. 170,635, Aug. 10, 1971, Pat. No. 3,951,946, which is a continuation-in-part of Ser. No. 810,946, March 27, 1969, abandoned. This application June 12, 1975, Ser. No. 586,174
Claims priority, application Germany, Mar. 27, 1968, 1768054; Apr. 4, 1968, 1768140; Apr. 4, 1968, 1768142; Apr. 4, 1968, 1768143; Mar. 12, 1969, 1912518
Int. Cl.² C07J *19/00*
U.S. Cl. 536—7 **1 Claim**

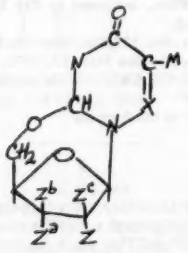
1. Cyclopentanone helveticoside.

3,975,374
PROCESS FOR PREPARING 2-THIOURACIL NUCLEOSIDES

James H. Hunter, and Harvey I. Skulnick, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 100,423, Dec. 21, 1970, abandoned. This application Jan. 7, 1974, Ser. No. 431,253
Int. Cl.² C07H *17/02*
U.S. Cl. 536—23 **4 Claims**

1. The process consisting of reacting a (2,5′-anhydro-1-β-D-pentofuranosyl)uracil or (2,5′-anhydro-1-β-D-pentafuranosyl)-6-azauracil nucleoside, having the following structural formula:



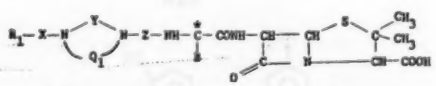
wherein X is CH or N, M is a member selected from the group consisting of hydrogen, lower alkyl of from 1 to 4 carbon atoms, inclusive, hydroxy-lower alkyl of from 1 to 3 carbon atoms, inclusive, loweralkoxymethyl wherein the alkoxy is from 1 to 4 carbon atoms, inclusive, and the acetic, propionic or butyric esters of the said hydroxyloweralkyl, and Z, Z^a, Z^b, and Z^c are selected from the group consisting of hydrogen, hydroxy, and alkoxy of from 1 to 3 carbon atoms, inclusive with methanol in the presence of an alkali metal alkoxide to produce the corresponding 1-β-D-pentofuranosyl-2-O-methyluracil or 2-O-methyl-6-azauracil, respectively and treating the latter intermediates with hydrogen sulfide to obtain the corresponding 1-β-D-pentofuranosyl-2-thiouracil or -2-thio-6-azauracil respectively.

3,975,375
PENICILLINS

Hans-Bodo König; Wilfried Schröck, and Karl-Georg Metzger, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 3, 1974, Ser. No. 502,753
Claims priority, application Germany, Oct. 23, 1971, 2152967; Oct. 23, 1971, 2152968
Int. Cl.² C07D *499/46*
U.S. Cl. 260—239.1 **28 Claims**

1. A compound selected from the group consisting of a penicillin of the formula



wherein the carbon atom designated by * constitutes a center of chirality;

R_1 is alkoxy of 1 to 8 carbon atoms;

each of X, Y and Z, independently of the others, is —CO— or —CS—;

B is thienyl, cyclohexenyl, cyclohexa-1,4-dien-1-yl, phenyl or phenyl substituted by one or two members selected from the group consisting of halo, nitro, hydroxy, methoxy, methylthio and alkyl of 1 to 5 carbon atoms; and

Q_1 is ethylene or trimethylene unsubstituted or substituted by one or two methyl groups;

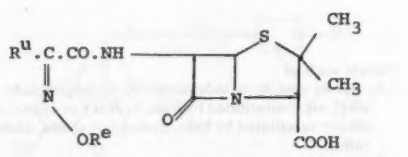
and the pharmaceutically acceptable salts thereof.

3,975,376
PENICILLINS HAVING A 6β-(α-ETHERIFIED OXIMINO) ACYLAMIDO GROUP

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Division of Ser. No. 304,501, Nov. 7, 1972, Pat. No. 3,932,385, which is a continuation-in-part of Ser. No. 252,846, May 12, 1972, abandoned. This application Oct. 31, 1975, Ser. No. 627,905
Claims priority, application United Kingdom, May 14, 1971, 15082/71; Oct. 25, 1972, 49256/72
Int. Cl.² C07D *499/70*
U.S. Cl. 260—239.1 **11 Claims**

1. A penicillin antibiotic of the formula



wherein R^a is furyl; benzofuryl or either of these groups substituted by chlorine, bromine, iodine, fluorine, hydroxy, lower alkyl, nitro, amino, lower alkylamino, diloweralkylamino, lower alkanoyl, lower alkanoylamino, lower alkoxy, lower alkylthio or carbamoyl and R^e is alkyl of 1–16 carbon atoms; alkenyl of 2–16 carbon atoms; alkynyl of 2–16 carbon atoms;

cycloalkyl of 3–7 carbon atoms; cycloalkenyl of 4–7 carbon atoms; phenyl; naphthyl; a heterocyclic radical selected from the group consisting of thienyl; furyl; pyridyl; pyrimidyl; pyrrolyl; N-methylpyrrolyl; N-benzyloxymethylpyrrolyl; thiazolyl; isothiazolyl; diazolyl; triazolyl; tetrazolyl; thiadiazolyl; thiatriazolyl; oxazolyl; oxadiazolyl; 3- or 4-isoxazolyl; sydnone; benzothienyl; benzofuryl; indolyl; benzimidazolyl; benzoxazolyl and purinyl; phenyl lower alkyl; diphenylmethyl; triphenylmethyl; naphthyl lower alkyl; heterocyclic lower alkyl in which the heterocyclic moiety is derived from said heterocyclic radical, or any of these groups substituted by hydroxy, lower alkoxy, phenoxy, benzyloxy, mercapto, lower alkylthio, phenylthio, benzylthio, amino, chlorine, bromine, iodine, fluorine, nitro, azido, carboxy, lower carbalkoxy, formyl, acetyl, propionyl, benzoyl, acetoxy, propionyloxy, pivaloyloxy, cyano, phthalimido, acetamdio, benzamido, lower alkoxycarbonylamino or benzyloxycarbonylamino; or a physiologically acceptable salt thereof.

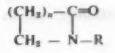
3,975,377

PROCESS FOR PREPARING N-ALKYL-LACTAMS

Claude Poulain, Orsay, France, assignor to Ato Chimie, Courbevoie, France

Filed Mar. 28, 1975, Ser. No. 562,905
Int. Cl.² C07D *201/14*
U.S. Cl. 260—239.3 R **10 Claims**

1. A process for preparing pure N-alkyl-lactams obtained by the reaction of the corresponding lactamate of an alkali metal and an alkyl halide and having the general formula:



where R is a saturated hydrocarbon aliphatic radical, the linear or branched chain of which comprises between 6 and 2 carbon atoms, and *n* is an integer between 4 and 14, which comprises reacting the N-alkyl-lactam in an organic solvent, containing the corresponding cycloalkylene imine as an impurity, at atmospheric temperature with a flow of carbon dioxide until the cycloalkylene imine precipitates completely in the form of an insoluble carbonate, and is then separated from the precipitate.

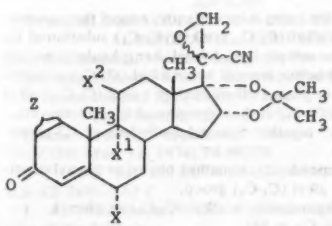
3,975,378

20-CYANO-20,21-EPOXY STEROIDS

John W. Patterson, Mountain View, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 27, 1975, Ser. No. 590,776
Int. Cl.² C07J *17/00*
U.S. Cl. 260—239.55 D **21 Claims**

1. A compound selected from the group of compounds represented by the formula



wherein

Z is double or single bond;
X is H, F or Cl;
X^1 is H, F or Cl; and
X^2 is OH or when X^1 is Cl, X^2 may be Cl.

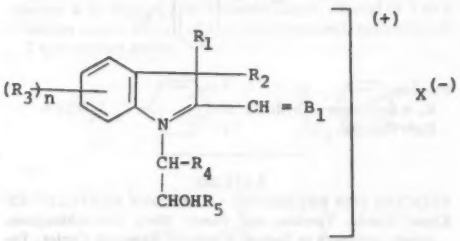
3,975,379

DIHYDROINDOLES AND INDOLENINE DYESTUFFS

Ernst Schmitt, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 206,537, Dec. 9, 1971, Pat. No. 3,860,583.
This application May 1, 1974, Ser. No. 466,052
Claims priority, application Germany, Dec. 9, 1970, 2060614
Int. Cl.² C07D *209/04*
U.S. Cl. 260—240 E **7 Claims**

1. Methine dyestuff of the formula

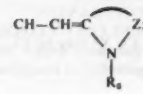


in which

R_1 and R_2 are C_1—C_4-alkyl;
R_3 is hydrogen, a non-ionic substituent, carboxyl, or together with the ring, to which it is attached, a benzene ring;
n is 1, 2, 3 or 4;
R_4 and R_5 are hydrogen or a non-ionic substituent;
$X^{(-)}$ is an anion;

said non-ionic substituents selected from the group consisting of C_1—C_9 alkyl, chloromethyl, C_1—C_{12}-alkoxymethyl, phenoxymethyl, p-nitrophenoxymethyl, p-methoxyphenoxy, p-chlorophenoxymethyl, allyloxymethyl, propargyloxymethyl, hydroxymethyl, di-C_1—C_4-alkylaminomethyl, diallylaminomethyl, pyrrolidinomethyl, phthalimidomethyl, allyl, trifluoromethyl, phenyl, benzyl, cyclohexyl, C_1—C_4-alkoxy, sulfamoyl, CN, carbomethoxy, carboethoxy, fluorine, chlorine, methylmercapto, methylsulfonyl and acetylamino;

B_1 is CH — Ar_1 or



Z together with C and N to which it is attached, forms an indolinyl-2-ring;

Ar_1 is a radical of the p-amino-benzene, naphthalene; benzofurane, benzothiophene, indole, indoline, 1,2,3,4-tetrahydroquinoline, carbazole, quinoxaline, dihydro-[benzo-1,4-oxazine], dihydro-[benzo-1,4-thiazine], 9, 10-dihydro-phenazine, phenoxazine or phenthiazine series;

R_6 is methyl, ethyl or benzyl.

3,975,380

SUBSTITUTED AURONES

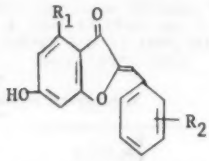
Kenneth M. Snader, Hatboro, Pa., and Chester R. Willis, Blackwood, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed June 3, 1974, Ser. No. 475,726

Int. Cl.² C07D *307/83*

U.S. Cl. 260—240 R **3 Claims**

1. A chemical compound of the formula:



wherein:

R_1 is hydrogen or hydroxy; and

R_2 is fluorine.

3,975,381

PROCESS FOR PREPARING γ-LACTONE DERIVATIVES

Kiyosi Kondo, Yamato, and Fumio Mori, Kawachinagano, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

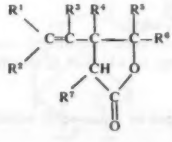
Filed Dec. 27, 1974, Ser. No. 536,781

Claims priority, application Japan, Dec. 27, 1973, 48-144501

Int. Cl.² C07D *307/26, 307/28, 307/94*

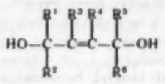
U.S. Cl. 260—240 R **8 Claims**

1. A process for preparing a γ-lactone derivative having the formula (I)



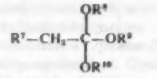
(I)

wherein R^1, R^2, R^3, R^4, R^5 and R^6, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or phenyl group which may be substituted with a halogen atom, and R^1 and R^2, and R^5 and R^6 may, when taken together with the carbon atom to which they are attached, form a cycloalkyl group having 4 to 7 carbon atoms, and R^7 represents a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 4 to 6 carbon atoms, a phenyl group which may be substituted with an alkyl group having 1 to 3 carbon atoms, which comprises reacting an allylic diol having the formula (II)



(II)

wherein R^1, R^2, R^3, R^4, R^5 and R^6 are as defined above, with an orthocarboxylic acid ester having the formula (III)



(III)

wherein R^7 is as defined above and R^8, R^9 and R^{10}, which may be the same or different, each represents an alkyl group having 1 to 5 carbon atoms or a cycloalkyl group having 4 to 6 carbon atoms, in the presence of an acidic catalyst.

3,975,382

PYRAZOL(5)/PYRAZOLONE(5)METAL COMPLEXES AS STABILIZERS FOR ORGANIC MATERIALS

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

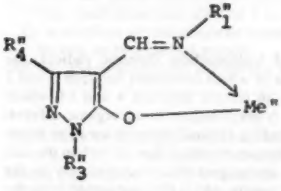
Filed Mar. 14, 1975, Ser. No. 558,179

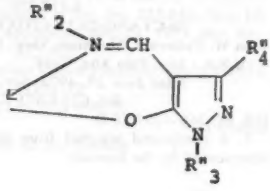
Claims priority, application Switzerland, Mar. 21, 1974, 3931/74

Int. Cl.² C07D *231/10*

U.S. Cl. 260—240 G **7 Claims**

1. A compound of the formula





wherein either

R_1'' and R_2'' are each, independently, one of the monovalent groups alkyl (C_1-C_{18}), alkyl (C_1-C_4) substituted by piperidino or morpholino, benzyl, benzyl substituted on the phenyl nucleus thereof by an alkyl (C_1-C_4) substituent, phenyl or phenyl substituted by 1 or 2 (C_1-C_{12}) alkyl groups with C_1-C_{12} in the aggregate of the substituents,

or R_1'' and R_2'' together form a 1,2-ethylene or 1,3-propylene bridge,

each R_3'', independently, is methyl, phenyl or phenyl substituted by an alkyl (C_1-C_4) group,

each R_4'', independently, is alkyl (C_1-C_3) or phenyl,

and Me'' is Ni, Cu or Mn.

3,975,383

3-BENZYL-7-TRIPHENYLMETHYLAMINO-3-CEPHEM-4-CARBOXYLIC ACID AND SALTS AND ESTERS THEREOF

John Herbert Charles Nayler, Dorking; Michael John Pearson, Roffey, and Robert Southgate, Barns Green, all of England, assignors to Beecham Group Limited, England

Division of Ser. No. 303,959, Nov. 6, 1972, abandoned. This application Aug. 29, 1974, Ser. No. 501,846

Claims priority, application United Kingdom, Jan. 3, 1972, 142/72; Apr. 21, 1972, 18694/72; Sept. 9, 1972, 41972/72

Int. Cl.² C07D *501/18*

U.S. Cl. 260—243 C 1 Claim

1. The compound methyl 3-benzyl-7-triphenylmethylamino-3-cephem-4-carboxylate.

3,975,384

2,4,5,6-TETRASUBSTITUTED PYRIMIDINES AND SALTS THEREOF

Berthold, Narr; Josef Roch; Erich Müller, and Walter Haarmann, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

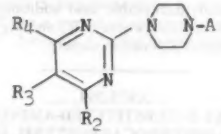
Filed Aug. 14, 1974, Ser. No. 497,459

Claims priority, application Germany, Aug. 20, 1973, 2341925; June 26, 1974, 2430644

Int. Cl.² C07D *417/14*

U.S. Cl. 260—243 R 9 Claims

1. A compound of the formula



wherein

A is hydrogen, alkanoyl of 1 to 4 carbon atoms or acetyl-(alkanoyl of 1 to 4 carbon atoms),

R_2 is thiomorpholino, 1-oxido-thiomorpholino or 1,1-dioxido-thiomorpholino,

R_3 is chlorine, bromine or nitro, and

R_4 is cyano, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 6 carbon atoms or (alkyl of 1 to 6 carbon atoms)-mercapto, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,975,385

7-TRICHLOROACETAMIDO-3-DESACETOXY-CEPHALOSPORANIC ACID ESTERS

Jean Bouchaudon, Morsang-sur-Orge; Pierre Le Roy, Thiais, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

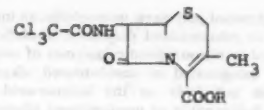
Filed Sept. 5, 1974, Ser. No. 503,274

Claims priority, application France, Sept. 6, 1973, 73.32150; Mar. 12, 1974, 74.08378

Int. Cl.² C07D *501/22*, *501/10*

U.S. Cl. 260—243 C 4 Claims

1. A 7-trichloroacetamido-3-desacetoxy-cephalosporanic acid of the formula:



in which R is alkyl of 1 to 4 carbon atoms, unsubstituted or substituted by halogen, benzyl, unsubstituted or substituted by nitro or alkoxy of 1 to 4 carbon atoms, or phenacyl.

3,975,386

N-SUBSTITUTED-3-AZAISATOIC ANHYDRIDES

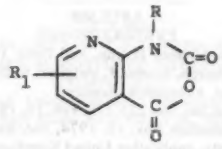
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 326,850, Jan. 26, 1973, Pat. No. 3,859,289. This application Jan. 3, 1975, Ser. No. 538,407

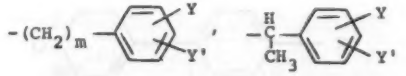
Int. Cl.² C07D *265/00*, *273/00*, *295/00*

U.S. Cl. 260—244 A 22 Claims

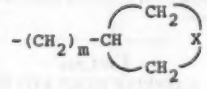
1. A compound of the formula:



wherein R is alkyl of 1 to 7 carbon atoms, alkenyl of 3 to 8 carbon atoms, alkynyl of 3 to 6 carbon atoms, cyanoalkyl of 2 to 6 carbon atoms,



or



m is 0 to 2,

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 3 carbon atoms,

X is a direct bond or $-(CH_2)_p-$,

p is 1 to 3, and

each of Y and Y' is, independently, hydrogen, fluoro, chloro, or lower alkyl of 1 to 3 carbon atoms, or both are lower alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo, trifluoromethyl, or lower alkoxy of 1 to 2 carbon atoms.

3,975,387

REMOVAL OF UNCONSUMED REACTANTS AND POLAR BY-PRODUCTS FROM REACTION PRODUCT MIXTURES THROUGH ADSORPTION ON POLYURETHANE FOAM

Raymond C. Schlicht, Fishkill, and Frederic C. McCoy, Beacon, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 6, 1974, Ser. No. 440,096

Int. Cl.² C07C *85/26*, *91/10*; C07D *295/12*

U.S. Cl. 260—247.5 R 14 Claims

1. In the separation and recovery of unreacted amines and amine reaction by-products having a molecular weight of less than about 500 from the reaction of an olefinic-containing reactant selected from an unsubstituted, nitrated, nitro-oxi-

dized or halogenated polymeric monoolefin; an unsubstituted, halogenated or nitrooxidized polymeric di-olefin; a halogenated, nitrated or nitrooxidized copolymer of said mono and di-olefins; a halogenated or unsubstituted alkenyl succinic acid, succinic anhydride or the lactone-acid derivatives thereof; said halogenated or unsubstituted alkenyl moiety in each of said succinic acid, succinic anhydride and lactone-acid derivatives being a radical selected from a corresponding polymeric olefin, diolefin or copolymer thereof; and an amine reactant selected from (a) an alkylene amine of the formula:

$$H_2N-[R-NH]_nH$$

wherein R is an alkylene radical of from about 2 to about 8 carbon atoms and *n* is an integer of from about 1 to about 6, (b) an ethoxylated amine, (c) a propoxylated mono-, di-, or polyamine, (d) an amino substituted piperazine, or (e) an amino substituted morpholine, the steps that comprise forming a solution of said reaction product with a hydrocarbon solvent and contacting said solution with polyurethane foam for a period of time sufficient to permit adsorption by said foam of a substantial portion of said unreacted amine and amine byproduct.

3,975,388

PYRIDAZINONES

Mehmood Abdulhameed Hakim, and Peter Thomas Bysouth, both of Edinburgh, Scotland, assignors to BDH Pharmaceuticals Limited, Edinburgh, Scotland

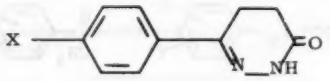
Continuation of Ser. No. 225,270, Feb. 10, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,538

Claims priority, application United Kingdom, Feb. 22, 1971, 5082/71

Int. Cl.² C07D *237/04*

U.S. Cl. 260—250 A **3 Claims**

1. A compound of the formula:



wherein X is: a straight or branched chain alkoxy group having 3-12 carbon atoms.

3,975,389

CAFFEINE DERIVATIVES

Giuliana Arcari; Pietro De Micheli; Fulvio Luini, and Ugo Scarponi, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

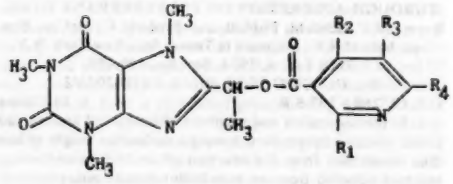
Filed Sept. 23, 1974, Ser. No. 508,571

Claims priority, application Italy, Sept. 26, 1973, 29406/70

Int. Cl.² C07D *473/12*

U.S. Cl. 260—254 **16 Claims**

1. A compound having broncholitic activity and having the general formula:



where R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, chlorine, bromine, an alkyl or an alkoxy radical having from 1 to 4 carbon atoms.

3,975,390

N-METHYL SUBSTITUTED PIPERAZINO NITROBENZOPHENONES AND A PROCESS FOR THE PREPARATION THEREOF

Edit Tóth; József Törley; Éva Pálosi; Szaholes Szeberényi; László Szporny; Sandor Górág, and Csilla Mészáros, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

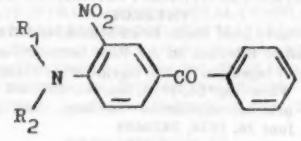
Division of Ser. No. 485,701, July 3, 1974. This application Aug. 12, 1975, Ser. No. 603,854

Claims priority, application Hungary, July 26, 1973, RI 517

Int. Cl.² C07D *295/06, 295/10*

U.S. Cl. 260—268 PH **2 Claims**

1. A compound of the formula:



or pharmaceutically acceptable acid addition or quaternary ammonium salts thereof, wherein R_1 and R_2 together form N-methyl substituted piperazino moiety.

3,975,391

5-[1-HYDROXY-2-(SUBSTITUTED-AMINO)]ETHYL-8-HYDROXY-3,4-DIHYDROCARBOSTYRIL DERIVATIVES

Kazuyuki Nakagawa, Tokushima; Shiro Yoshizaki, Naruto; Kaoru Tanimura, and Shigeharu Tamada, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Company Limited, Tokyo, Japan

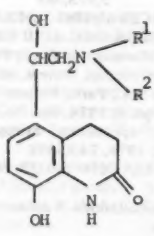
Filed Dec. 26, 1974, Ser. No. 536,704

Claims priority, application Japan, Dec. 26, 1973, 49-4192; May 22, 1974, 49-58316; May 27, 1974, 49-60003; May 27, 1974, 49-60004; May 27, 1974, 49-60005; Aug. 26, 1974, 49-97660; May 27, 1974, 49-60006; Aug. 26, 1974, 49-97661; Aug. 26, 1974, 49-97662; Aug. 26, 1974, 49-97663; Sept. 2, 1974, 49-101260; Nov. 11, 1974, 49-130719; Nov. 11, 1974, 49-130720; Nov. 11, 1974, 49-130728; Dec. 4, 1974, 49-140339; Dec. 4, 1974, 49-140340

Int. Cl.² C07D *215/26, 215/22*

U.S. Cl. 260—288 R **6 Claims**

1. A 5-[1-hydroxy-2-(substituted-amino)]ethyl-8-hydroxy-3,4-dihydrocarbostril compound represented by the formula (I)



(I)

wherein R^1 and R^2, which may be the same or different, each represents a hydrogen atom, an alkyl group each having 1 to 4 carbon atoms, a phenylalkyl group wherein the alkyl moiety is a straight or branched chain alkyl moiety having 1 to 4 carbon atoms or a cycloalkyl group having 4 to 6 carbon atoms, or R^1 and R^2 may, when taken together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocyclic ring selected from the group consisting of pyrrolidino and, piperidino, said heterocyclic ring being unsubstituted or substituted with an alkyl group having 1 to 4 carbon atoms.

3,975,392

PREPARATION OF 3-METHYLPIPERIDINE

Lawson G. Wideman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 27, 1975, Ser. No. 591,184

Int. Cl.² C07D *295/02*

U.S. Cl. 260—293.52 **5 Claims**

1. In the process for the preparation of 3-methylpiperidine which comprises hydrogenating α-methylene glutaronitrile in a multi-stage hydrogenation employing as a hydrogenation catalyst a highly dispersed nickel catalyst wherein the first stage hydrogenation is conducted at a temperature ranging from about 20° to about 50°C and at a hydrogen pressure of at least about 14 kg/cm² and wherein the second stage hydrogenation is conducted at temperatures ranging from about 150°C to about 175°C and a hydrogen pressure of at least about 42 kg/cm², the improvement comprising after the uptake of hydrogen ceases in the second stage reducing the temperature below the boiling point of any of the materials in the process, venting all excess hydrogen and heating the then formed 2-methyl-1,5-diaminopentane to a temperature 150° to about 175°C for a period of at least 2 hours to cause the cyclization of 2-methyl-1,5-diaminopentane to 3-methylpiperidine.

3,975,393

CERTAIN 2-PYRIDYL-PHOSPHONAMIDOTHIOATES AND DERIVATIVES THEREOF

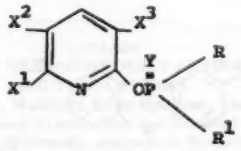
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 468,847, May 10, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,861

Int. Cl.² C07D *213/52*

U.S. Cl. 260—294.8 K **14 Claims**

1. A compound of the formula:



wherein

Y represents a chalcogen of atomic number 8 to 16, inclusive;

each X^1, X^2 and X^3 independently represents hydrogen, bromo, chloro, fluoro or trifluoromethyl, with the proviso that at least one of X^1, X^2 and X^3 is always other than hydrogen;

R represents an alkyl radical of 1 to 3 carbon atoms;

R^1 represents

and

R^2 and R^3 each independently represent hydrogen, methyl or ethyl.

3,975,394

PROCESS FOR 2-MERCAPTOBENZOTHIAZOLE

George Louis Mina, Pennsville, and John Erjavec, Phillipsburg, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 14, 1974, Ser. No. 523,954

Int. Cl.² C07D *277/72*

U.S. Cl. 260—306 **6 Claims**

1. A process for preparing 2-mercaptobenzothiozole which comprises reacting benzothiazole with sulfur in a molar ratio of benzothiazole to sulfur in a range of from about 1:0.9 to 1:1.3 at a temperature of from about 200° to 260°C. for about 30 minutes to 3 hours.

3,975,395

ARYL-TETRAZOL-5-YLTHIO- AND THIOETHER-SUBSTITUTED HYDROQUINONE COMPOUNDS

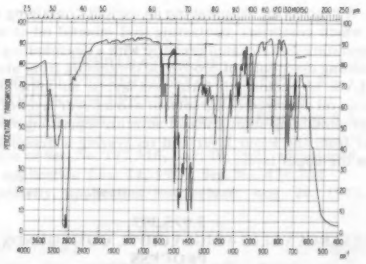
Reiichi Ohi, and Tadao Shishido, Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 19, 1974, Ser. No. 534,394

Claims priority, application Japan, Dec. 19, 1973, 48-143291

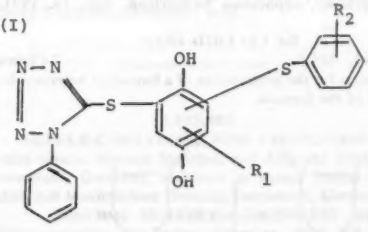
Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **3 Claims**



1. A tri-substituted hydroquinone compound having the general formula (I)

(I)



(I)

wherein R_1 represents an alkyl group having 6 to 18 carbon atoms or an alkylthio group having 6 to 18 carbon atoms; and R_2 represents a hydrogen atom, an alkyl group having 1 to 5

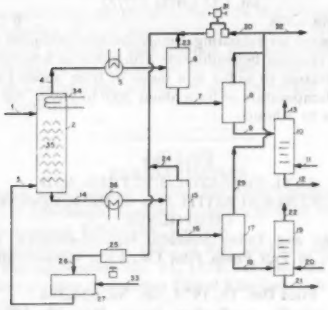
carbon atoms, a nitro group, a carboxylic acid group or an alkoxycarbonyl group having 1 to 18 carbon atoms in the alkoxy moiety thereof.

3,975,396

DEASPHALTING PROCESS

James D. Bushnell, Berkeley Heights, and Douglas G. Ryan, Livingston, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 21, 1975, Ser. No. 551,896
Int. Cl.² C10G 21/14
U.S. Cl. 208—309 8 Claims



1. A process for deasphalting an asphalt-containing mineral oil, which comprises: contacting said mineral oil at elevated temperature and elevated pressure with a deasphalting solvent consisting essentially of propylene containing from about 2 to 25 LV% of acetone to form two layers, an upper layer of viscous oil dissolved in the solvent and a lower layer of asphaltenes containing some oil and solvent, separating the upper layer from the lower layer and recovering a deasphalted oil from the upper layer.

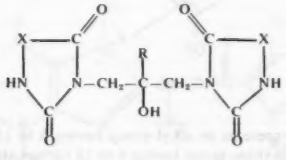
3,975,397

HETEROCYCLIC TRIGLYCIDYL COMPOUNDS AND PROCESS

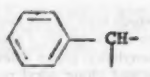
Juergen Habermeier, Pfeffingen, and Daniel Porret, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

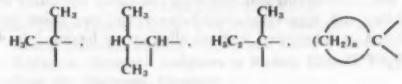
Division of Ser. No. 238,982, March 28, 1972, Pat. No. 3,821,243. This application Mar. 14, 1974, Ser. No. 540,291
Claims priority, application Switzerland, Apr. 14, 1971, 5398/71
Int. Cl.² C07D 49/32
U.S. Cl. 260—309.5 2 Claims

1. A process for the preparation of a binuclear heterocyclic compound of the formula



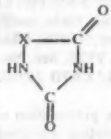
wherein X is



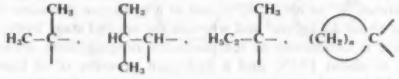


n=4 or 5

comprising reacting a hydantoin compound of the formula



wherein X is



n=4 or 5

with 1 mole of an epihalohydrin having an R radical in the 2 position wherein R is hydrogan or an alkyl of 1 to 4 carbon atoms, to yield the corresponding monohalohydrin compound, said compound being condensed with 1 more mole of said hydantoin compound.

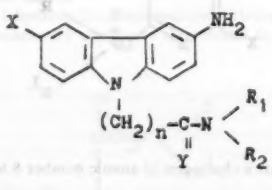
3,975,398

9-SUBSTITUTED 3-AMINOCARBAZOLE COMPOUNDS

Wolfgang Werner, Mannheim-Vogelstang; Peter Vogel, Weinheim; Hugo Tiedemann, Mannheim-Wallstadt, and Werner Guthlein, Mannheim-Neckarau, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed July 10, 1974, Ser. No. 487,338
Claims priority, application Germany, Aug. 1, 1973, 2338932
The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.
Int. Cl.² C07D 209/88
U.S. Cl. 260—315 12 Claims

1. 9-Substituted 3-aminocarbazole compound of the formula:



(I')

wherein

X is hydrogen or halogen,

Y is oxygen or represents two hydrogen atoms; and

R_1 and R_2, which can be the same or different, are hydrogen, lower alkyl or hydroxyalkyl of up to 6 carbon atoms, or amino; and

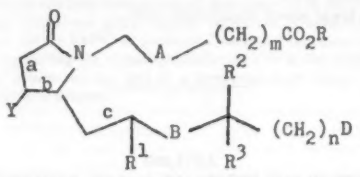
n is 1 or 2, with the proviso that when *n* is 2, X, Y, R_1 and R_2 cannot all be hydrogen atoms,
or a salt thereof with an inorganic or organic acid.

3,975,399
1,5-DISUBSTITUTED-2-PYRROLIDINONES, -3-PYRROLIN-2-ONES, AND -4-PYRROLIN-2-ONES

Robert Jay DeFranco, and Richard M. Scribner, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1974, Ser. No. 495,199
Int. Cl.² C07D *207/28, 207/30*
U.S. Cl. 260—326.2 **16 Claims**

1. A compound of the formula



wherein
A is —CH=CH—, —C ≡ C—, phenylene or —CH_2—;
B is —CH_2—, <C=O or

D is —CH_3, —CF_2CH_3 or —CF_3;
Y is H or —OR^5;
R is H; alkyl of 1–10 carbons; cycloalkyl of 3–8 carbons; phenyl carbons any substituents being halogen, sulfino, sulfo, sulfamoyl, sulfanilyl, sulfoamino or sulfanilamido; aralkyl of 7–10 carbons; alkaryl of 7–10 carbons; or a physiologically acceptable cation;
R^1, R^2 and R^3 individually are H, CH_3 or C_2H_5;
R^4 is H, alkyl of 1–4 carbons, vinyl or ethynyl;
R^5 and R^6 individually are H, CH_3, C_2H_5, tetrahydropyranyl, benzyl, acyl of 1–4 carbons or trialkyl sily in which the alkyl has 1–10 carbons;
m and *n* individually are whole numbers in the range 1–8;
a, *b* and *c* individually are an optional additional bond
with the provisos that
if *c* is present, only one of *a* and *b* is present; if *c* is absent, only one of *a* and *b* is present and A is not —C≡C—; if *a* or *b* is present, Y is H; and with the further provisos that
if R is tertiary butyl, Y is H,
O-tetrahydropyranyl or trialkyl silyl and R^6 is not tetrahydropyranyl.

3,975,400
METHOD OF CONTINUOUSLY PRODUCING γ-BUTYROLACTAMS

Walter Himmele, Walldorf; Ernst Hofmann, Ludwigshafen; Herwig Hoffmann, Frankenthal, and Reinhold Plass, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 71,738, Sept. 14, 1970, abandoned. This application Feb. 21, 1973, Ser. No. 334,398
Claims priority, application Germany, July 27, 1968, 1795007
Int. Cl.² C07D *207/26*
U.S. Cl. 260—326.5 FN **4 Claims**

1. A liquid-phase process for continuously producing γ-butyrolactams which comprises passing a γ-butyrolactone selected from the group consisting of γ-butyrolactone and γ-butyrolactone having an alkyl or alkoxy group with 1 to 4 carbon atoms in said group as a substituent and liquid ammonia separately to the bottom of a vertical reaction tube, said reaction tube having a relief valve at its discharge and, maintaining the reaction mixture at a temperature of from 180° to 340°C and maintaining the pressure within said tube by means of said relief valve at a value which is from 10 to 250 percent higher than the sum of the partial pressures of the reactants at said temperature, said reaction tube being filled with liquid reaction mixture during said reaction any gas phase that is formed in said tube being released.

3,975,401
PROCESS FOR THE DEHYDRATION OF BIS-MALEAMIC ACIDS

Maurice Balme, Sainte-Foy-les-Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Sept. 28, 1973, Ser. No. 401,603
Claims priority, application France, Oct. 2, 1972, 72.34822
Int. Cl.² C07D *207/44*
U.S. Cl. 260—326.26 **4 Claims**

1. In a process for the dehydration of a bis-maleamic acid by heating the bis-maleamic acid with a lower carboxylic acid anhydride in acetone, in the presence of 0.2 to 1 mol of tertiary amine per mol of bis-maleamic acid and of a soluble nickel derivative and precipitating the resulting bis-maleimide by the addition of water to the final reaction mixture, the improvement wherein 0.1 to 10 mols of water per mol of bis-maleamic acid are added to the bis-maleamic acid, lower carboxylic acid anhydride, acetone, tertiary amine and nickel derivative at the start of the reaction.

3,975,402
PREPARATION OF N-[(1-ETHYL-PYRROLIDINYL-2)-METHYL]-2-METHOXY-5-SULPHAMOYL-BENZAMIDE

Fred Kuenzy, Pully, Switzerland, assignor to Fratmann S.A., Switzerland

Continuation of Ser. No. 197,515, Nov. 10, 1971, abandoned. This application June 12, 1974, Ser. No. 478,764
Claims priority, application Switzerland, Aug. 20, 1971, 12267
Int. Cl.² C07D *207/12*
U.S. Cl. 260—326.82 **2 Claims**

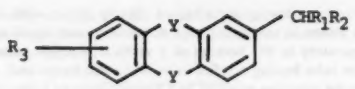
1. Process for preparing N-(1-ethyl-pyrrolidinyl-2)-methyl)-2-methoxy-5-sulphamoyl-benzamide which comprises the steps of reacting an excess of about two mol-equivalents of 1-ethyl-2-aminomethyl-pyrrolidine with one mol-equivalent of phosphorous trichloride in pyridine as the reaction medium and then reacting the resultant product with 2-methoxy-5-sulphamoyl-benzoic acid.

3,975,403
SULFUR-CONTAINING RING COMPOUNDS

Joachim Gante; Werner Mehrhof, and Albrecht Wild, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Sept. 10, 1973, Ser. No. 395,980
Claims priority, application Germany, Sept. 19, 1972, 2245940
Int. Cl.² C07D *327/08, 335/12, 339/08*
U.S. Cl. 260—327 P **25 Claims**

1. A compound of the formula



wherein R_1 is COOH, $COOR_4$; R_2 is CH_3 or C_2H_5; R_3 is H, F, Cl or Br; R_4 is alkyl of 1–8 carbon atoms; and Y is CH_2, O or S, at least one Y being S; and the physiologically acceptable salts thereof.

3,975,404

BICYCLIC LACTONE INTERMEDIATES

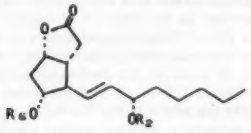
Frank H. Lincoln, Jr., Portage; John E. Pike, and Gilbert A. Youngdale, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 326,642, Jan. 26, 1973, abandoned, which is a division of Ser. No. 140,251, May 4, 1971, abandoned. This application Feb. 20, 1975, Ser. No. 551,248

Int. Cl.² C07D *307/77*

U.S. Cl. 260—343.3 R **9 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein R_2 is alkyl of 1 to 5 carbon atoms, inclusive, and R_6 is hydrogen, tetrahydropyranyl, benzoyl, or acetyl.

3,975,405

MONOPHOSPHATE SALT OF o-CRESOLPHTHALEIN

Thomas E. Hamill, Fort Lauderdale, Fla., assignor to Coulter Diagnostics, Inc., Hialeah, Fla.

Filed Aug. 1, 1974, Ser. No. 493,775

Int. Cl.² C07D *307/94;* **C12K** *1/04*

U.S. Cl. 260—343.4 **5 Claims**

1. An o-cresolphthalein monophosphoric acid wherein the phosphoric acid moieties are optionally reacted with a hydroxide selected from the group consisting of alkali metal, alkaline earth metal, ammonium, cyclohexylammonium, tetramethylethylenediammonium, and ethanolammonium hydroxides.

3,975,406

HEXAHYDRO-5-OXY-2-LOWERALKOXY-2H-CYCLOPENTA[b]-FURAN-4-CARBONITRILE INTERMEDIATES FOR PROSTAGLANDINS

Hans Johann Mayer, 5 Obere Hofackerstrasse, Fullinsdorf; Albert Eduard Fischli, 38 Missionsstrasse, Basel, both of Switzerland; Michael Josef Klaus, 17 Efringerstrasse, Weil am Rhein, Germany, and Alexander Eduard Wick, 34 Muhlestiegstrasse, Riehen, Switzerland

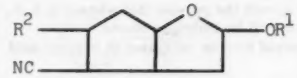
Division of Ser. No. 374,850, June 29, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,128

Claims priority, application Switzerland, July 6, 1972, 10120/72

Int. Cl.² C07D *307/93*

U.S. Cl. 260—346.2 R **3 Claims**

1. A compound of the formula:



wherein R^1 is lower alkyl; and R^2 is selected from the group consisting of hydroxy, tetrahydro-pyranyloxy, 4-methoxy-5,6-dihydro-2H-pyranyloxy, benzyloxy, trityloxy, benzhydryloxy, alphaloweralkoxy loweralkoxy, trimethylsilyloxy, and hydroxy-protected as its ester, said ester being hydrolyzable and derived from phosphoric acid,

lower alkanoic acid,

aryl lower alkanoic acid,

carbonic acid,

and lower alkane dicarboxylic acid.

3,975,407

METHOD FOR PRODUCING MALEIC ANHYDRIDE

Ryuhei Ueeda, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Continuation-in-part of Ser. No. 301,933, Oct. 30, 1972, Pat. No. 3,906,008. This application May 14, 1975, Ser. No. 577,482

Claims priority, application Japan, Nov. 2, 1971, 46-88132; Nov. 4, 1971, 45-87780; July 21, 1972, 47-73548; July 27, 1972, 47-75252

The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 A **16 Claims**

1. A method for preparing maleic anhydride which comprises oxidizing a gaseous mixture containing an olefinic hydrocarbon having 4 or 5 carbon atoms or a hydrocarbon mixture thereof and oxygen or an oxygen-containing gas in a reaction zone in the presence of a catalyst consisting essentially of the oxides of tungsten and phosphorus, the atomic ratio of tungsten to phosphorus being less than 30, and at least one catalyst promoter selected from the group consisting of compounds of alkali metals, alkaline earth metals, alkaline earth metals, copper, zinc, chromium, bismuth and titanium at a temperature in the range of from 250°C. to 650°C.

3,975,408

COLOR STABILIZATION OF REFINED DICARBOXYLIC ACID ANHYDRIDES

Ronald J. Boyer, Crystal City; Raymond E. Stenseth, St. Louis, both of Mo., and Richard J. Sheehan, Palos Hills, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 41,116, May 27, 1970, abandoned. This application Oct. 31, 1972, Ser. No. 302,624

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 R **8 Claims**

1. A composition comprising a major amount of refined maleic anhydride and from about 0.01 to about 1,000 parts per million by weight, based on the weight of the maleic anhydride, of a treating agent selected from at least one of the group consisting of halides of titanium, zirconium, hafnium, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum, vanadium, chromium, manganese, mercury, silicon, phosphorus, bismuth, antimony, lead, cerium, and sulfur.

3,975,409

PREPARATION OF CIS-7,8-EPOXY-2-METHYLOCTADECANE

Karl Eiter, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 284,826, Aug. 30, 1972, abandoned.
This application Feb. 26, 1974, Ser. No. 446,064
Claims priority, application Germany, Sept. 10, 1971, 2145454
Int. Cl.² C07D *301/12*; C07C *11/22*, *5/16*
U.S. Cl. 260—348.5 L 7 Claims

1. In the production of cis-7,8-epoxy-2-methyl-octadecane wherein 2-methyloctadecene-7-cis is prepared and then epoxized, the improvement which comprises preparing the 2-methyloctadecene-7-cis by contacting isoheptylbromide with an organometallic compound of dodecine-(1) in the presence of an anhydrous polar organic diluent at a temperature of about 20° to 150°C to produce 2-methyloctadecine-(7), and hydrogenating the 2-methyloctadecine-(7) in the presence of a palladium catalyst and at a temperature of about −10° to +60°C in a diluent.

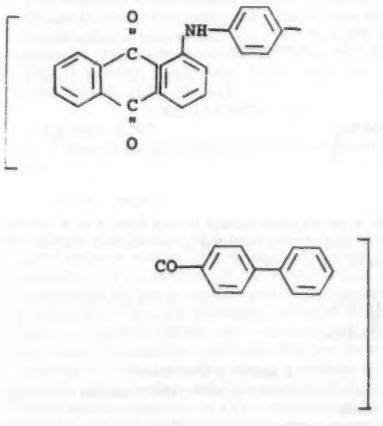
3,975,410

PROCESS FOR THE MANUFACTURE OF HALOGEN-CONTAINING ANTHRAQUINOIDAL COMPOUNDS, THEIR USE AND NEW HALOGEN-CONTAINING ANTHRAQUINOIDAL COMPOUNDS

Arnold Wick, Therwil, and Max Jost, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,877
Claims priority, application Switzerland, Oct. 10, 1973, 14393/73
Int. Cl.² C07C *49/68*
U.S. Cl. 260—376 2 Claims

1. Compounds of the formula



wherein Hal is bromo or chloro and *p* has a value of 1 to 2.

3,975,411

PROCESS FOR PREPARING 1-AMINOANTHRAQUINONE

Muneyasu Sameshima; Tagui Osawa, and Utaka Hirai, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 557,058
Claims priority, application Japan, Sept. 9, 1974, 49-104824
Int. Cl.² C07C *97/24*
U.S. Cl. 260—378 15 Claims

1. A process for the preparation of 1-aminoanthraquinone comprising the steps of catalytically hydrogenating 5-nitro-1,4,4*a*,9*a*-tetrahydroanthraquinone in an aqueous reaction medium in the presence of a catalytically effective amount of a hydrogenation catalyst and a base and oxidizing the resultant reaction product with air or an oxidizing agent.

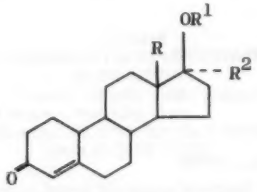
3,975,412

MONO-ACYLATION OF 17-HYDROXY-3-ALKOXYGONA-2,5-(10)DIENES

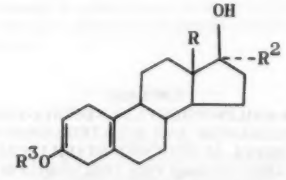
Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,675
Int. Cl.² C07J *1/00*
U.S. Cl. 260—397.4 5 Claims

1. A process for preparing a compound of the structure:



wherein R is alkyl of from 1 to 6 carbon atoms, R^1 is carboxylic acyl of from 1 to 4 carbon atoms, and R^2 is alkyl of from 1 to 6 carbon atoms, alkenyl of from 2 to 6 carbon atoms, or alkynyl of from 2 to 6 carbon atoms; which comprises treating a compound of the structure:



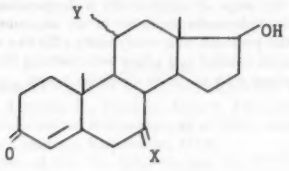
wherein R and R^2 are as defined above and R^2 is alkyl of from 1 to 6 carbon atoms or cycloalkyl of from 3 to 7 carbon atoms; with perchloric acid and a compound of the formula $(R^1)_2O$ wherein R^1 is as defined above, utilizing an ester of formula R^3OR^4 as solvent wherein R^1 is as defined above and R^4 is alkyl of from 1 to 6 carbon atoms for from about 1 to about 10 minutes.

3,975,413
NOVEL HAPTENES AND ANTIGENS

Andre Pierdet, 7, rue Pierre Feuillere, 93130 Noisy-le-Sec, and Daniel Coussediere, 116, rue Ambroise Croizat, 94800 Villejuif, both of France

Filed July 2, 1975, Ser. No. 592,619
Claims priority, application France, July 4, 1974, 74.23281
Int. Cl.² C07J 9/00
U.S. Cl. 260—397.1 10 Claims

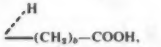
1. A haptene of the formula



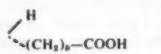
wherein X is

when Y is

in the α- or β-position and R'' is selected from the group of p-phenylene and $-(CH_2)_a-$ and a is a whole number from 1 to 18 with the proviso that a is other than 2 and when Y is hydrogen, X is selected from the group consisting of



and



and $=N-O-(CH_2)_c-COOH$, b is a whole number from 1 to 18 and c is a whole number from 1 to 12.

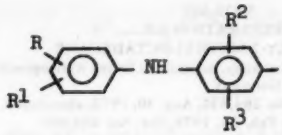
3,975,414
N,N-BIS(4-ANILINOPHENYL)-4,7-DITHIA-5-METHYL-DECANEDIAMIDE AND RELATED COMPOUNDS USEFUL AS POLYMER STABILIZERS

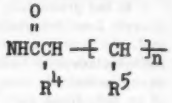
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 8, 1975, Ser. No. 575,861
Int. Cl.² C08J 3/20
U.S. Cl. 260—42.47 8 Claims

1. A compound having the following structural formula:

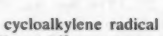
wherein A and A¹ have the following structural formula:





wherein R and R¹ are selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms and alkoxy radicals having 1 to 4 carbon atoms; R² and R³ are selected from the group consisting of hydrogen and alkyl radicals having 1 to 4 carbon atoms; R⁴ is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms; R⁵ is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms; wherein X has the structure

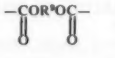
wherein R⁶ is selected from the group consisting of alkylene radicals having from 1 to 6 carbon atoms, cycloalkylene radicals having from 5 to 12 carbon atoms, and radicals having the structural formula



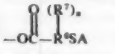
wherein R¹⁰ is a cycloalkylene radical having from 5 to 12 carbon atoms, R¹¹ and R¹² are alkylene radicals having from 1 to 6 carbon atoms, and n^4 is 0 or 1 and wherein R⁷ is an alkyl radical having from 1 to 4 carbon atoms, R⁸ is an alkylene radical having from 1 to 6 carbon atoms, Y is selected from the group consisting of

—O—, —S—, 1,4-phenylene

and



wherein R⁹ is an alkylene radical having from 2 to 6 carbon atoms which can be unsubstituted or substituted with one or two groups of the structure



n, n^2 and n^3 are 0 or 1 and n^1 is 0 or 1 to 4.

2. A polymer containing an antioxidant amount of a compound of claim 1.

8. The polymer according to claim 7 wherein the polymer is silica loaded.

3,975,415
ORGANOTIN COMPLEXES OF PLATINUM AND PALLADIUM

Dale Robert Coulson, and Linda P. Seiwell, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 5, 1975, Ser. No. 574,352
Int. Cl.² C07F *15/00*
U.S. Cl. 260—429 R **12 Claims**

1. A trans compound of the formula

$$MX_{2-n}L_2(SnR_3)_n$$

wherein
M is platinum or palladium;
X is H, Cl, Br or I;
L is R'_3P or $(R'O)_3P$ in which
R′, alike or different, is aryl of 6–12 carbons, alkyl of 1–6 carbons and such groups containing up to two halogens;
R, alike or different, is aryloxy of 6–12 carbons, arylcarboxy of 7–13 carbons and such groups containing up to two halogens; and
n is 1 or 2.

3,975,416
PREPARATION OF YTTRIUM AND LANTHANIDE HEXAFLUOROISOPROPOXIDE DIAMMONIATES

Khodabakhsh S. Mazdiyasni, Xenia, and Barbara J. Schaper, Enon, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 6, 1973, Ser. No. 394,891
Int. Cl.² C07F *5/00*
U.S. Cl. 260—429.2 **11 Claims**

1. A process for preparing yttrium and lanthanide hexafluoroisopropoxide diammoniates which comprises reacting anhydrous yttrium chloride or an anhydrous lanthanide chloride with 1,1,1,-3,3,3-hexafluoroisopropanol in the presence of anhydrous ammonia, the reaction being conducted at a temperature in the range of zero to 5°C in a reaction medium consisting essentially of diethyl ether.

3,975,417
PROCESS FOR PRODUCING HALOGENATED ORGANOTIN COMPOUNDS

Seiji Sagawa, Hirakata; Osamu Kimura, Toyonaka; Kenji Sekimori, Machida, and Fumiyuki Ito, Hatogaya, all of Japan, assignors to Sumitomo Chemical Company, Osaka and Kyodo Chemical Company, Ltd., Tokyo, both of, Japan

Continuation-in-part of Ser. No. 354,138, April 24, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,868
Claims priority, application Japan, Apr. 28, 1972, 47-43129; Aug. 3, 1972, 47-78109
Int. Cl.² C07F *7/22*
U.S. Cl. 260—429.7 **6 Claims**

1. A process for producing an octyltin chloride of the formula

$$(n\text{-}C_8H_{17})_mSnCl_{4-m}$$

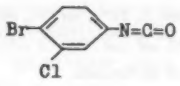
wherein *m* is an integer of 1 to 3, which comprises reacting n-octyl chloride with metallic tin in the presence of, as a first component, (1) a mixture of (a) a phosphorus compound selected from the group consisting of triethyl phosphite, tributyl phosphite, triphenyl phosphite, triphenyl phosphate, diphenyl phosphorchloridate and tetraethylphosphonium iodide, with (b) an amine compound selected from the group consisting of N-methyl pyrrolidone, quinoline, morpholine, pyridine, dibutylamine, tributylamine, triphenylamine and N,N-dimethylformamide, or (2) a nitrogen-containing phosphorus compound selected from the group consisting of hexamethylphosphoramide, dimethylphosphoramidic dichloride and tetramethylphosphoramidic chloride, together with, as a second component, at least one member selected from the group consisting of bromine, iodine, PBr_3, $AlBr_3$, CuI_2, MgI_2, $MgBr_2$, $ZnBr_2$ and ZnI_2 which are capable of evolving bromine or iodine at the reaction temperature employed, and as a third component, an organic solvent selected from the group consisting of n-butyl alcohol, methoxybutyl alcohol, 2-ethylhexyl alcohol, n-octyl alcohol, decyl alcohol and lauryl alcohol.

3,975,418
4-BROMO-3-CHLORO-PHENYLISOCYANATE

Dieter Duerr, Bottmingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 384,348, July 31, 1973, abandoned, which is a division of Ser. No. 63,288, Aug. 12, 1970, Pat. No. 3,749,746, which is a continuation-in-part of Ser. No. 642,140, May 29, 1967, abandoned. This application May 27, 1975, Ser. No. 581,253
Claims priority, application Switzerland, June 22, 1966, 9057/66
The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.
Int. Cl.² C07C *119/048*
U.S. Cl. 260—453 AR **1 Claim**

1. The isocyanate of the formula

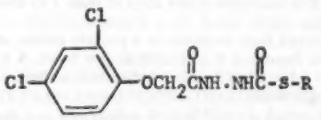


3,975,419
2,4-DICHLOROPHENOXYACETYL THIOLCARBAMATE HYDRAZINES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 10, 1975, Ser. No. 639,314
Int. Cl.² C07C *155/02*
U.S. Cl. 260—455 A **10 Claims**

1. A compound having the general structural formula:



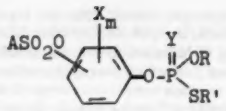
wherein R is selected from the group consisting of alkyl contaiing 1 through 8 carbon atoms, halosubstituted alkyl containing 1 through 8 carbon atoms, phenyl, benzyl and halosubstituted phenyl.

3,975,420
O,S-DIALKYL O-SULFONYLOXY-PHENYL PHOSPHOROTHIOLATES AND PHOSPHORODITHIOATES

William S. Hurt, Collegeville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 519,448, Oct. 31, 1974, abandoned. This application May 12, 1975, Ser. No. 576,838
Int. Cl.² C07C *143/68*
U.S. Cl. 260—456 P **8 Claims**

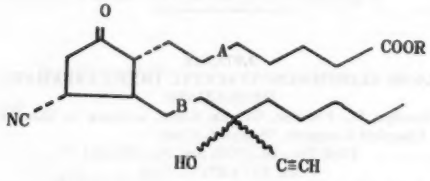
1. A compound of the formula:



wherein
R is a (C_1–C_4) alkyl group;
R′ is a (C_2–C_8) alkyl group;
Y is an oxygen atom or a sulfur atom;
X is a halogen atom, a (C_1–C_5) alkyl group, or a (C_1–C_5) alkoxy group;
m is an integer from 0 to 3; and
A is a (C_1–C_5) alkyl group.

3,975,421
15-SUBSTITUTED 11α-CYANO-PROSTAGLANDINS AND RELATED COMPOUNDS
Donald P. Strike, St. Davids, and Wenling Kao, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.
Filed Sept. 5, 1974, Ser. No. 503,214
Int. Cl.² C07C *121/46, 121/48*
U.S. Cl. 260—464 **4 Claims**

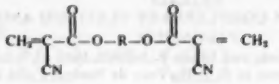
1. A compound of the formula:



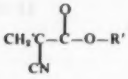
wherein R is hydrogen, lower alkyl of from 1 to about 6 carbon atoms, alkali metal, or a pharmaceutically acceptable cation derived from ammonia or a primary amine; and A is a cis double bond and B is a trans double bond; A is a single bond and B is a trans double bond; or A is a single bond, and B is a single bond.

3,975,422
PREPARATION OF BIS (2-CYANOACRYLATE)MONOMERS
Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Continuation-in-part of Ser. No. 308,375, Nov. 21, 1972, abandoned, and Ser. No. 308,376, Nov. 21, 1972, abandoned.
This application Oct. 4, 1974, Ser. No. 512,276
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.4 **17 Claims**

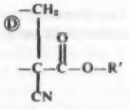
1. In the preparation of bis (2-cyanoacrylate) monomer represented by the General Formula VI



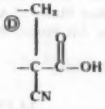
from 2-cyanoacrylic acid ester of the General Formula I



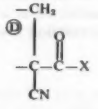
the steps comprising:
a. introducing a blocking group Ⓓ by means of a Diels-Alder reaction in which a cyclic 1,3-diene is reacted with said cyanoacrylic ester of Formula I to give a compound of the General Formula II



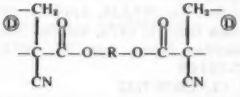
b. converting said compound of General Formula II by hydrolysis to a compound represented by Formula III



converting the compound of Formula III to an acyl halide represented by the General Formula IV(B):

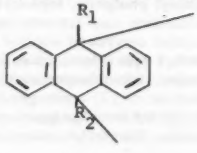


c. coupling two acyl groups of compounds of Formula IV(B) to each other through an — O — R — O — linkage by esterification with a difunctional alcohol to form a compound represented by the General Formula V

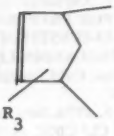


d. and then heating the compound of Formula V with maleic anhydride to displace said blocking groups and form said bis (2-cyanoacrylate) of Formula VI; wherein said blocking group

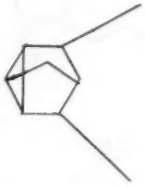
of Formula II, III, and V is any one of the group consisting of



where R_1 and R_2 are the same R_1 and R_2 are selected from the group consisting of H, an alkyl group of 1 to 5 carbons, phenyl, Br or Cl and where R_1 and R_2 are different, R_1 is H and R_2 is a member selected from any of the group consisting of an alkyl group of 1 to 5 carbons, phenyl, Br and Cl;



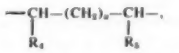
where R_3 is H or CH_3; and



wherein the organo linking group R of Formulas VI and V is the same and is any one of the group consisting of:

$-(CH_2)_m-$,

where m is an integer of from 1 to 20 inclusive;

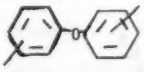


where n is an integer of from 0 to 18 inclusive, and R_4 and R_5 are independently hydrogen or a C_1 to C_5 alkyl group, R_4 and R_5 not simultaneously being hydrogen;

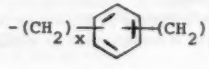
$-(CH_2)_r-Z-(CH_2)_s-$,

where Z is $-O-$, $-S-$, $-CH=CH-$; $-C\equiv C-$;

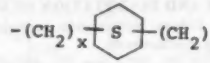
and



where r and s are independent integers of from 1 to 10 inclusive and r and s total from 2 to 20, R_6 and R_7 are independently hydrogen or a straight or branched chain C_1 and C_5 alkyl group



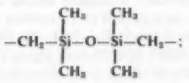
where x and y are integers of from 1 to 6 inclusive;



where x and y are as hereinbefore defined;

$-CH_2-(CF_2)_z-CH_2-$,

where z is an integer of from 1 to 10 inclusive; and



and wherein R' of Formula I and II is an alcohol moiety selected from C_1 to C_{16} alkyl, cyclohexyl or phenyl.

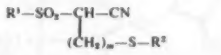
3,975,423

ALKYLTHIOALKYL-SUBSTITUTED ALKYLSULFONYLACETONITRILES

Alan L. Borror, and Richard B. Greenwald, both of Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 8, 1975, Ser. No. 575,584
Int. Cl.² C07C *121/16*
U.S. Cl. 260—465.1 **7 Claims**

1. A compound of the formula



wherein R^1 and R^2 each represent lower alkyl containing 1 to 4 carbon atoms and m is a whole number 2 to 5.

3,975,424

METHOD FOR MANUFACTURE OF TETRAFLUOROTEREPHTHALONITRILE

Shozo Fujii, and Kan Inukai, both of Nagoya, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,544
Claims priority, application Japan, July 4, 1974, 49-76714
Int. Cl.² C07C *121/58*
U.S. Cl. 260—465 G **3 Claims**

1. A method for the manufacture of tetrafluoroterephthalonitrile, which comprises mixing tetrachloroterephthalonitrile, from 0.2 to 1.5 moles per atom of chloride of said tetrachloroterephthalonitrile of dry powdered potassium fluoride and a polar solvent selected from the group consisting of dimethylformamide, diethylformamide, dimethylacetamide, N-methyl-2-pyrrolidone, dimethylsulfoxide, hexamethylphosphoramide and tetramethylenesulfone having a water content of not more than 0.2% by weight, heating the resultant mixture at temperatures not exceeding the boiling point of said polar solvent but exceeding 130°C with simultaneous agitation and thereby causing formation of tetrafluoroterephthalonitrile in said mixture and separating from the mixture the formed tetrafluoroterephthalonitrile.

3,975,425
PROCESS FOR CARRYING OUT NITROSATION REACTIONS AND DIAZOTATION REACTIONS

Willem J. Wassen, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Oct. 10, 1973, Ser. No. 405,078
Claims priority, application Netherlands, Oct. 14, 1972, 7213944
Int. Cl.² C07C 77/00, 76/00
U.S. Cl. 260—466 15 Claims

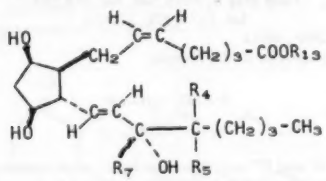
1. Process to carry out nitrosation reactions and diazotization reactions, in which a compound which is (1) phenol, (2) an aliphatic alcohol, (3) a primary aromatic amine of the formula $ArNH_2$ wherein Ar is an aryl of 6 to 14 carbon atoms or (4) a secondary amine of the formula $R_1—NH—R_2$ wherein each of R_1 and R_2 is alkyl of from 1 to 6 carbon atoms or aryl of from 6 to 14 carbon atoms into which a nitroso group can be introduced is reacted with a nitrite in the presence of an acid, this process being characterized in that ammonium nitrite is applied as the nitrite.

3,975,426
8β,11β,12α-PGF$_{2\beta}$-COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,430
Int. Cl.² C07C 177/00
U.S. Cl. 260—468 D 5 Claims

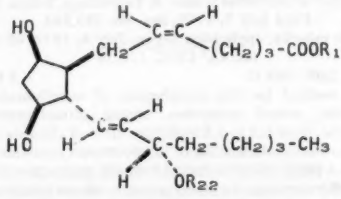
1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different; with the proviso that at least one of R_4 and R_5 is methyl; and

wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

5. An optically active compound of the formula



wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;

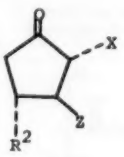
including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen; wherein R_{22} is alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

3,975,427
METHOD FOR PREPARATION OF (dl)-13-SUBSTITUTED SULFINYL-PROSTAGLANDIN-LIKE COMPOUNDS

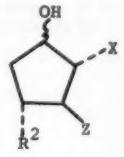
Karl G. Untch, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 5, 1974, Ser. No. 476,363
Int. Cl.² C07C 147/14
U.S. Cl. 260—470 16 Claims

1. Process for the production of the (dl) compounds of the formulas:

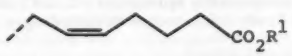


(A)



(B)

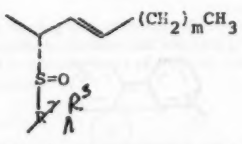
wherein X is



or $---(CH_2)_mCO_2R^1$, in which R^1 is alkyl containing from one through three carbon atoms, and *m* is a whole integer from two through eight;

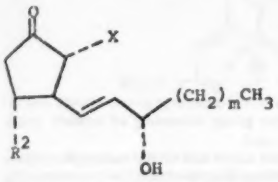
R^2 is hydrogen or hydroxyl;

Z is

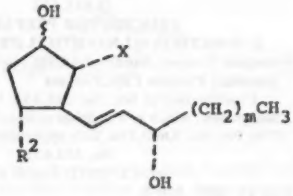


in which R^3 is alkyl containing from one through six carbon atoms, cycloalkyl containing from five through seven carbon atoms, chloromethyl, trichloromethyl, trifluoromethyl, chlorodifluoromethyl, dichlorofluoromethyl, β-chloroethyl, α-chloroethyl, α-chloro-β-trichloroethyl, phenyl, p-tolyl, p-chlorophenyl, p-fluorophenyl, 2,4-dichlorophenyl, or 2,5-dichlorophenyl and m is defined as above; and the wavy line (ξ) represents the α or β configuration or mixtures thereof, which comprises:

a. treating the (dl) compounds of the formulas



(I)



(II)

wherein X (including R^1 and m contained therein), R^2 and m are defined as above; with a substituted sulfenyl chloride compound of the formula $ClSR^3$, wherein R^3 is defined as above, in the presence of an amine base selected from the group consisting of triethylamine, N-methylpyrrolidine or pyridine, and an organic solvent to obtain the (dl) compounds of Formulas (A) and (B), respectively.

3,975,428

AROMATIC AMINES FORMED BY THE REACTION OF ISATOIC ACID ANHYDRIDE WITH COMPOUNDS CONTAINING AT LEAST ONE TERTIARY NITROGEN ATOM AND AT LEAST TWO HYDROXYL GROUPS

Johannes Blahak, Cologne; Erwin Muller, and Karl Hartwig Richert, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

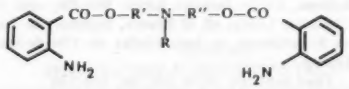
Continuation of Ser. No. 306,783, Nov. 15, 1972, abandoned. This application Feb. 6, 1974, Ser. No. 440,210

Claims priority, application Germany, Dec. 7, 1971, 2160590

Int. Cl.² C07C *101/54*

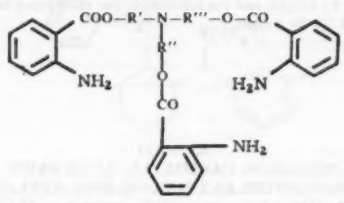
U.S. Cl. 260—472 **10 Claims**

1. Diamines of the formula:



wherein R is a saturated or unsaturated C_1 to C_{18} alkyl radical; C_3 to C_{10} cycloalkyl radical; C_7 to C_{11} aralkyl radical or C_6 to C_{18} aryl radical; and R′ and R″ are the same or different and represent C_2 to C_{30} alkylene radicals which may be interrupted by oxygen atoms.

4. Triamines of the formula:



wherein

R′, R″ and R‴ are the same or different and represent C_2 to C_{30} alkylene radicals which may be interrupted by oxygen atoms.

3,975,429

CYCLOPROPANEMETHYL ESTERS OF CINNAMIC ACID AND DERIVATIVES THEREOF

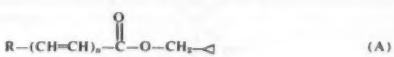
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 412,806, Nov. 5, 1973, Pat. No. 3,928,413, which is a continuation-in-part of Ser. No. 350,708, April 13, 1973, Pat. No. 3,923,871, which is a continuation-in-part of Ser. No. 263,902, June 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 255,368, May 22, 1972, abandoned. This application Sept. 15, 1975, Ser. No. 613,395

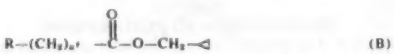
Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 R **12 Claims**

1. A compound of formula A or B



(A)



(B)

wherein,

n is one or two;

n′ is zero or a positive integer from one to 10; and

R is phenyl or naphthyl, each substituted by one or more of alkoxy, aralkoxy or aryloxy.

3,975,430

PROCESS FOR THE PREPARATION OF ALKYLSULPHONATE COMPOUNDS

Carlo Neri, and Emilio Perrotti, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 471,707, May 20, 1974, abandoned, which is a continuation of Ser. No. 369,244, June 12, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,609

Claims priority, application Italy, June 21, 1972, 25984/72

Int. Cl.² C07C *143/02*

U.S. Cl. 260—513 B **4 Claims**

1. Process for the production of a long chain alkyl sulphonate, adapted for use as a detergent, by reacting an alkali metal bisulphite with one or more alpha-olefines having from 10 to 20 carbon atoms, wherein the improvement comprises contacting the alkali metal bisulphite with a stoichiometric excess of said alpha-olefine or alpha-olefines in a liquid solvent mixture of isopropyl alcohol and water in the presence of oxygen and a metal promoter selected from the group consisting of MnO_2 and Mn_3O_4, at a temperature below the boiling point of water, and at a pH from 8.5 to 2, the isopropyl alcohol/water ratio in said solvent mixture being between 1.2

and 2.5 by weight, and the solvent/olefine ratio being between 6/1 and 3/1 by weight.

3,975,431

PREPARING CARBOXYLIC ACIDS FROM GLYCIDONITRILES THROUGH ENOL ACYLATES

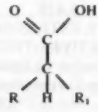
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 271,389, July 13, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,433

Int. Cl.² C07C *63/52*

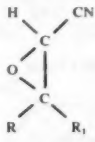
U.S. Cl. 260—515 R **3 Claims**

1. The process for the production of a carboxylic acid of the formula:

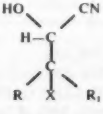


wherein R when taken separately represents hydrogen or an aliphatic, or aromatic group and R_1 when taken separately represents an aliphatic or aromatic group; and R and R_1 when taken together and connected represents an alicyclic group, which comprises:

1. treating a glycidonitrile of the formula:

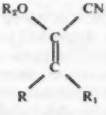


wherein R and R_1 have the meaning given, above, with a hydrogen halide selected from the group consisting of hydrogen chloride, hydrogen bromide and hydrogen iodide to obtain a 2-hydroxy-3-halopropionitrile of the formula:



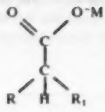
wherein R and R_1 have the meanings given, above, and X is selected from the group consisting of chloro, bromo, and iodo;

2. acylating and dehydrohalogenating the 2-hydroxy-3-halopropionitrile thus obtained to obtain an enol acylate of the formula:



wherein R and R_1 have the meanings given, above, and R_2 is the acyl radical of an organic carboxylic acid;

3. subjecting the enol acylate so obtained to hydrolysis with an aqueous alkali metal base to obtain an alkali metal salt of a carboxylic acid of the formula:



wherein R and R_1 have the meanings given, above, and M^+ is selected from the group consisting of sodium, potassium, and lithium, and

4. acidifying the alkali metal salt of the carboxylic acid so obtained with a strong acid to obtain the corresponding free carboxylic acid.

3,975,432

PROCESS FOR PREPARING 2-(6-METHOXY-2-NAPHTHYL)PROPIONIC ACID

Francisco Alvarez, Sunnyvale, Calif., assignor to Syntex Corporation, Panama City, Panama

Continuation of Ser. No. 235,432, March 16, 1972, abandoned, which is a division of Ser. No. 95,377, Dec. 4, 1970, Pat. No. 3,663,584. This application Feb. 21, 1974, Ser. No. 444,671

Int. Cl.² C07C *51/09*, *67/00*

U.S. Cl. 260—520 R **10 Claims**

1. A process for preparing 2-(6-methoxy-2-naphthyl)propionic acid comprising the steps of:

a. reacting di-(6-methoxy-2-naphthyl)zinc or 6-methoxy-2-naphthylzinc halide wherein the halide is a chloride, bromide or iodide, with a lower alkyl 2-halopropionate wherein the halo group is a chloro, iodo or bromo group, in an inert organic solvent until a lower alkyl 2-(6-methoxy-2-naphthyl)propionate is formed;

b. hydrolyzing the ester group of the 2-(6-methoxy-2-naphthyl)propionate; and

c. recovering 2-(6-methoxy-2-naphthyl)propionic acid from the reaction mixture.

3,975,433

1-(2,4-DIMETHOXY-PHENYL)-3-(2-HYDROXYETHYL)-THIOUREA

James R. McCarthy, Jr., Midland; Don V. Wysong, Farwell, and Bobbie J. Allen, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 438,927, Feb. 1, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,661

Int. Cl.² C07C *157/05*, *157/09*

U.S. Cl. 260—552 R **1 Claim**

1. The compound 1-(2,4-dimethoxyphenyl)-3-(2-hydroxyethyl)propionate; and

---

3,975,434

PROCESSES OF PRODUCING 2,5-DISUBSTITUTED BENZAMIDES

Gerard Bulteau, Paris; Jacques Acher, Itteville, and Jean-Claude Monier, Lardy, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

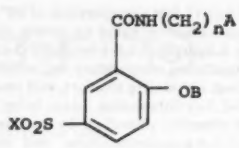
Filed Sept. 23, 1974, Ser. No. 508,536

Claims priority, application France, Sept. 25, 1973, 73.34436

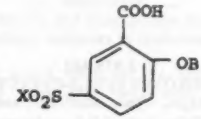
Int. Cl.² C07C *143/80*

U.S. Cl. 260—556 B **5 Claims**

1. The process of producing a 2,5-disubstituted benzamide, its acid addition salts and quaternary ammonium salts, said benzamide having the formula:



which comprises reacting in an inert solvent and at reflux temperature in the presence of a catalytic amount of 4-methyl 2-chloro 1-3-2-dioxophosphorinane a 2,5-disubstituted benzoic acid having the formula:



with an amine having the formula:

$H_2N(CH_2)_nA$

in which n is 1 or 2; B is alkyl having less than 5 carbon atoms or alkenyl having less than 5 carbon atoms, X is amino, monoalkylamino, dialkylamino, alkyl or alkenyl, the alkyl group of each of which has less than 5 carbon atoms, and A is a mono- or dialkylamino radical the alkyl group of wich has less than 5 carbon atoms, the molecular ratio of said 2,5-disubstituted benzoic acid to said amine being 1 to about 2.5.

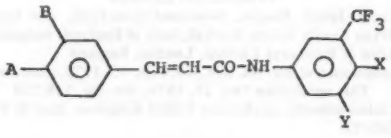
3,975,435

SUBSTITUTED CINNAMANILIDES

Edward J. Nikawitz, Glen Rock, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Mar. 6, 1974, Ser. No. 448,768
Int. Cl.² C07C *103/75*
U.S. Cl. 260—558 P **15 Claims**

1. A compound of the formula



wherein:

A is selected from the group consisting of H and Cl;
B is selected from the group consisting of Cl and Br;
X is selected from the group consisting of H and Cl; and
Y is selected from the group consisting of H and CF_3;

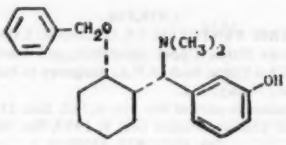
3,975,436

BENZYLAMINE NARCOTIC ANTAGONISTS

Horace Fletcher, Pottstown; Jerry L. Malis, Bluebell, and John P. Yardley, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 455,172, March 27, 1974, Pat. No. 3,937,818. This application Oct. 30, 1975, Ser. No. 627,485
Int. Cl.² C07C *87/28*
U.S. Cl. 260—570.5 R **2 Claims**

1. The compound having the formula:



substantially free of the trans epimer; and the pharmacologically acceptable acid addition salts thereof.

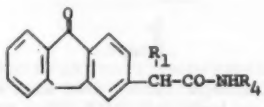
3,975,437

DIBENZO [a,d] CYCLOHEPTENE DERIVATIVES

Jean-Paul Brunet, Creteil, and Andre Cometti, Paris, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 447,059, Feb. 28, 1974, Pat. No. 3,933,905. This application Mar. 7, 1975, Ser. No. 556,389
Claims priority, application France, Mar. 2, 1973, 73.07508; Oct. 19, 1973, 73.17404; Jan. 23, 1974, 74.02214
Int. Cl.² C07C *103/20, 103/76*
U.S. Cl. 260—558 P **5 Claims**

1. A dibenzo[a,d]cycloheptene of the formula:



wherein R_1 is hydrogen or methyl, and R_4 is hydrogen, methyl or phenyl.

3,975,438

PREPARATION OF o-IODOANILINE

Ulrich Klabunde, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1974, Ser. No. 468,200
Int. Cl.² C07C *87/60*
U.S. Cl. 260—578 **16 Claims**

1. The process of converting p- to o-iodoaniline which comprises heating the former at about 150°–250°C. in the presence of 1–100 parts by weight of aniline per part of p-iodoaniline.

3,975,439

PREPARATION AND AMINATION OF IODOANILINE

Ulrich Klabunde, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 26, 1973, Ser. No. 382,844
Int. Cl.² C07C *85/02*
U.S. Cl. 260—581 **21 Claims**

1. A cyclic process of producing p-phenylenediamine from ammonia and aniline which comprises:

a. electrolyzing aniline with aqueous sodium iodide in an electrolytic cell having a cationic membrane to form an anolyte containing iodoaniline;
b. reacting the organic portion of the anolyte with ammonia at a molar ratio of ammonia to iodoaniline of at least 1:1 in the presence of a Cu(I) salt catalyst to form a liquid containing phenylenediamine, ammonium iodide and the 1:1 copper(I) iodide-p-phenylenediamine complex;
c. reacting the liquid from step (b) with sodium hydroxide;
d. recovering ammonia and p-phenylenediamine from the product of step (c); and
e. returning sodium iodide recovered after step (c) to step (a).

3,975,440

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

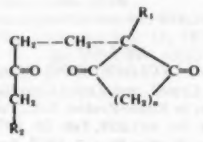
Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Dec. 9, 1970, Ser. No. 96,597

Int. Cl.² C07C *45/00*

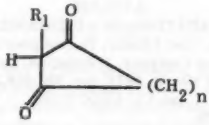
U.S. Cl. 260—586 C 7 Claims

1. A process for the preparation of a compound of the formula

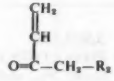


wherein R_1 is lower alkyl, aryl, aralkyl, acylamino, lower alkenyl, lower alkynyl, halogen, lower alkanoyloxy, or lower alkoxy carbonyl; R_2 is hydrogen, lower alkyl, aryl, aralkyl and $-(CH_2)_pR_3$ where p is an integer between 0 and 2 inclusive and R_3 is halogen, hydroxy, lower alkoxy, mesyloxy, tosyloxy, cyano or

where R_4 is hydrogen, hydroxy, lower alkyl, lower alkoxy, aryloxy and aryl lower alkoxy and R_5 is oxo, lower alkylenedioxy or arylenedioxy provided, however, that when R_4 is other than hydrogen or lower alkyl, R_5 is oxo; *n* is an integer between 1 and 5 inclusive; which process comprises reacting a compound of the formula



wherein R_1 and n are as above
with a compound of the formula



wherein R_2 is as above
in water.

3,975,441

PROCESS FOR RECOVERING PURIFIED 4-HYDROXY-2,4,6-TRIMETHYL-2,5-CYCLOHEXADIENE-1-ONE

Yataro Ichikawa; Yoshiyuki Yamanaka; Nobuo Suzuki, and Hideki Tsuruta, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 29, 1974, Ser. No. 464,950

Claims priority, application Japan, May 7, 1973, 48-49668

Int. Cl.² C07C *45/24*, *29/26*

U.S. Cl. 260—586 R 4 Claims

1. A process for recovering purified 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadien-1-one, which comprises distilling crude 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadien-1-one having a pH of 4 to 11.5 at a temperature of 60° to 200°C. and under a pressure which is equal to or less than the vapor pressure of 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadien-1-one at said distillation temperature and within the range of about 0.1 to about 180 mmHg absolute, said crude 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadien-1-one being obtained by oxidizing 2,4,6-trimethyl phenol or by rearrangement of 1-hydroxyamino-2,4,6-trimethylbenzene, and said pH value being measured by a solution obtained by dissolving 4 parts by weight of crude 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadien-1-one in an aqueous solution consisting of 10 parts by weight of methanol and 3 parts by weight of water, and recovering the purified 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadien-1-one.

3,975,442

2-ALKYL-2-(3-OXOALKYL)-1,3-CYCLOPENTADIONES

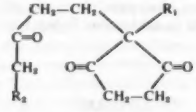
Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 96,597, Dec. 9, 1970, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application May 6, 1974, Ser. No. 467,355

Int. Cl.² C07C *49/27*

U.S. Cl. 260—586 R 4 Claims

1. A compound of the formula



wherein R_1 is lower alkyl and R_2 is hydrogen or lower alkyl.

3,975,443

1-(3,4-DICHLOROBENZAMIDOMETHYL)-CYCLOHEXYLDIMETHYLAMINE

Norman James Harper, Newcastel-upon-Tyne, and George Bryan Austin Veitch, Wythall, both of England, assignors to Allen & Hanburys Limited, London, England

Continuation of Ser. No. 289,366, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,720

Claims priority, application United Kingdom, June 6, 1972, 26248/72

Int. Cl.² C07C *103/82*

U.S. Cl. 260—558 D 1 Claim

1. 1-(3,4-dichlorobenzamidomethyl)-cyclohexyldimethylamine.

3,975,444

ETHYNYL-SUBSTITUTED AROMATIC ORTHO DIAMINES AND METHOD OF SYNTHESIS

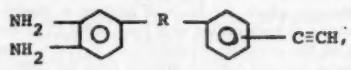
Robert F. Kovar, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The Unites States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1975, Ser. No. 578,847

Int. Cl.² C07C *93/14*, *87/58*

U.S. Cl. 260—571 3 Claims

1. A compound of the formula



wherein R is oxygen or sulfur

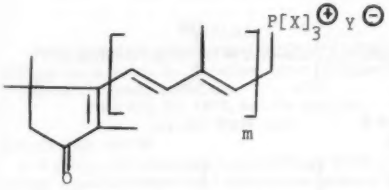
3,975,445

NOVEL POLYENE COMPOUNDS AND PROCESS THEREFOR

Frank Kienzle, Therwil, and Hans Johann Mayer, Fullinsdorf, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 9, 1975, Ser. No. 585,219
Claims priority, application Switzerland, June 20, 1974, 8457/74
Int. Cl.² C07C *49/76*
U.S. Cl. 260—590 C **4 Claims**

1. A compound of the formula:



XII

wherein X is an aryl group and Y is an anion of an acid selected from the group consisting of Cl^-, Br^-, R_9COO^-, wherein R_9 is lower alkyl or phenyl; *m* is zero or 1.

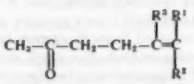
3,975,446

METHOD FOR THE PREPARATION OF UNSATURATED KETONES

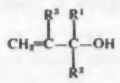
Tetsuro Kitagaki, Joetsu; Akira Yamamoto, Niigata, and Toshinobu Ishihara, Yono, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed June 25, 1974, Ser. No. 482,894
Claims priority, application Japan, June 26, 1973, 48-72094
Int. Cl.² C07C *45/00*, *45/18*
U.S. Cl. 260—593 R **13 Claims**

1. A method for the preparation of an unsaturated ketone represented by the general formula



where R^1 is a saturated or ethylenically unsaturated aliphatic cycloaliphatic or aromatic monovalent hydrocarbon group, R^2 is an alkyl group having from 1 to 6 carbon atoms, and R^3 is a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms, which comprises subjecting an unsaturated alcohol represented by the general formula



where R^1, R^2 and R^3 are as defined above, to a reaction with diketene at a temperature in the range from 135° to 170°C in the presence of a tertiary amine having the boiling point higher than 130°C and selected from the group consisting of quinoline, dimethylaniline, dimethylpyridine and ethylpyridine and an aluminum trialkoxide in which the alkoxy groups are lower alkoxy groups having from 1 to 4 of carbon atoms.

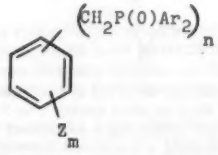
3,975,447

PREPARATION OF AROMATIC PHOSPHINE OXIDES BY REACTION OF DIARYLHALOPHOSPHINE AND BENZYLIC HALIDE

Walter Henry Knoth, Jr., Mendenhall, Pa., and Joseph John Mrowca, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

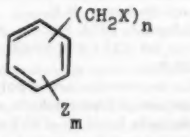
Filed Oct. 3, 1974, Ser. No. 511,531
Int. Cl.² C07F *9/02*
U.S. Cl. 260—606.5 P **7 Claims**

1. Method of preparing a phosphine oxide of the formula



wherein Ar is a mono- or di-carbocyclic aromatic radical which may be substituted by up to 5 substituents selected from the group consisting of halogen and alkyls of 1 to 3 carbon atoms, Z is halogen or alkyl of 1 to 3 carbon atoms, *n* is a whole number from 1 to 3, *m* is a whole number from 0 to 5, and $n + m$ is a whole number from 1 to 6, which comprises reacting

1. a benzylic halide of the formula



wherein X is chlorine, bromine or iodine; and Z, *n* and *m* are as specified above,

2. a diarylhalophosphine of the formula

Ar_2PX'

wherein Ar is as specified above, and X′ is chlorine, bromine or iodine, and

3. a hydroxide selected from the group consisting of alkali metal hydroxides and alkaline earth metal hydroxides

in the presence of a member selected from the group consisting of water, organic solvents, and mixtures thereof at a temperature of −50° to 250°C.

3,975,448

HALOGENATED ARALKYL ETHERS

Yvon Delaunois, Tessenderlo, and Claude Wilante, Brussels, both of Belgium, assignors to Tessenderlo Chemie S.A., Brussels, Belgium

Filed Aug. 31, 1973, Ser. No. 393,332
Claims priority, application France, Sept. 8, 1972, 72.31837
Int. Cl.² C07C *43/28*
U.S. Cl. 260—611 A **5 Claims**

1. An ether selected from the group consisting of 1′,1′-dimethyl-2′,2′,3′,3′-tetrafluoropropyl-2,4-dichlorobenzyl ether; 1′,1′-dimethyl-2′,2′,3′,3′-tetrafluoropropyl-3,4-dichlorobenzyl ether; 1′,1′-dimethyl-2′,2′,3′,3′-tetrafluoropropyl-2,6-dichlorobenzyl ether; and α,α′-di(1′,1′-dimethyl-2′,2′,3′,3′-tetrafluoropropyl)-m-xylene diether.

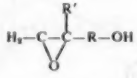
3,975,449

HYDROGENATION OF EPOXIDES TO PRIMARY ALCOHOLS

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 5, 1974, Ser. No. 494,572
Int. Cl.² C07C *29/00*
U.S. Cl. 260—635 E **10 Claims**

1. A process for producing a primary alcohol as the main product from an epoxide which comprises contacting the epoxide with hydrogen gas and a solid catalyst comprising nickel or cobalt at a temperature between 20° and 200°C. and a pressure sufficient to maintain liquid phase and wherein the epoxide has the following formula:



wherein R is an alkylene diradical of 1 to 5 carbon atoms and R′ is a hydroxy alkyl or alkyl having 1 to 5 carbon atoms. wherein the epoxide contacting is carried out in the presence of a solvent comprising a low molecular weight alcohol and water, and wherein the nickel or cobalt of the solid catalyst are in the elemental form or are the sulfide, oxide or hydride, thereby producing primary alcohol from the epoxide as the main product of the epoxide hydrogenation.

3,975,450

PROCESS FOR THE PREPARATION OF POLYHYDRIC ALCOHOLS

Billy W. Palmer; David L. Bondurant, and Hugh J. Hagemeyer, Jr., all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,331
Int. Cl.² C07C *29/00*
U.S. Cl. 260—635 P **11 Claims**

1. A process for the manufacture of polyhydric alcohols by the aldol condensation of formaldehyde with a second aldehyde having the formula $R_{3-n}H_nC—CHO$ wherein n is an integer of 1 to 3 inclusive and R is alkyl of 1 to 6 carbons in an aqueous medium in the presence of a sodium carbonate condensing agent which comprises the steps of (1) introducing the aldehydes in the ratio of from about $(n+1)$ to about $(1.1)(n+1)$ moles of formaldehyde per mole of second aldehyde and said sodium carbonate condensing agent into a stirred back mix reactor or a plurality of said reactors connected in series through which the reaction mixture is passed while being subject to back mixing until from about 85 to about 90 percent of the available formaldehyde is reacted and (2) withdrawing the said reaction mixture from the continuously stirred back mix reactor or reactors and introducing said reaction mixture near the top of a distillation column operated under substantially total reflux wherein the reaction mixture passes downwardly through the column and any remaining aldol condensation product is converted to the desired polyhydric alcohol.

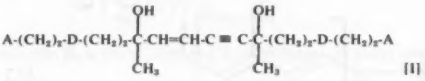
3,975,451

DIOLS AND PROCESS FOR PREPARATION THEREOF

Yoshiji Fujita; Takashi Nishida, and Kazuo Itoi, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

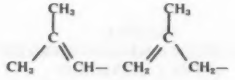
Filed May 30, 1975, Ser. No. 582,399
Claims priority, application Japan, May 30, 1974, 49-61204
Int. Cl.² C07C *33/04*
U.S. Cl. 260—635 Y **3 Claims**

1. A diol represented by the following general formula [I]:

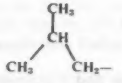


[I]

wherein A is



or



D is

or

and wherein A— groups may be the same or different and the —D— groups may be the same or different.

3,975,452

REPROCESSING OF FINAL ACID FROM NITROGLYCERINE PRODUCTION

Hans Rolf Jakob Mayer; Gerhard Langecker, both of Cologne, and Hans-Jürgen Gebauer, Troisdorf, all of Germany, assignors to Firma Josef Meissner, Cologne, Germany

Filed June 27, 1974, Ser. No. 483,757

Claims priority, application Germany, June 29, 1973, 2333144

Int. Cl.² C07C 79/10

U.S. Cl. 260—645 7 Claims

1. A process for treating final acid obtained in forming a nitrate of a polyhydric alcohol, said final acid comprising a mixture of sulfuric acid, nitric acid, water and said nitrate, said process comprising mixing said final acid with a stabilizing agent comprising a waste acid with a nitro-aromatic compound selected from the group consisting of nitrobenzene, nitrotoluene, nitroxylene, nitronaphthalene or nitroalkylbenzene and then with one of said nitro-aromatic compounds as an extractant, allowing said mixture to stratify whereby said nitrate is dissolved into said nitro-aromatic compound as one layer and there is another substantially nitrate-free waste acid layer comprising sulfuric acid, nitric acid and water, separating said layers, and contacting at least a portion of said waste acid layer with an aromatic compound selected from the group consisting of benzene, toluene, xylene, naphthalene, alkylbenzene, nitrobenzene, nitrotoluene, nitroxylene, nitronaphthalene and nitroalkylbenzene to effect nitration thereof, a portion of said waste acid layer being combined with fresh final acid prior to mixing of said fresh final acid with said nitro-aromatic compound, said waste acid thereby serving as the stabilizing agent for said fresh final acid.

3,975,453

PROCESS FOR PREPARING BUTYNYLLITHIUM

William Novis Smith, Jr., Stamford, Conn., assignor to Foote Mineral Company, Exton, Pa.

Filed Feb. 24, 1975, Ser. No. 552,317

Int. Cl.² C07F 1/02

U.S. Cl. 260—665 R 8 Claims

1. A process for preparing butynyllithium which comprises passing a gaseous unsaturated hydrocarbon selected from the group consisting of 1,2-butadiene or a mixture of 1,2-butadiene, 1,3-butadiene, 1-butyne and 2-butyne, said mixture containing from about 5% to about 100%, by weight, of 1,2-butadiene, 1,3-butadiene, 1-butyne and 2-butyne components, into a slurry of finely-divided lithium metal dispersed in a strong coordinating ether solvent, said slurry being under a substantially oxygen-free atmosphere, said hydrocarbon and said lithium metal being combined in a mol ratio of about 2:3.

3,975,454

CATALYST FOR HYDRODEALKYLATION OF ALKYLAROMATIC COMPOUNDS AND A PROCESS FOR PRODUCING THE CATALYST

Masaru Ichikawa, Tokorozawa; Eiji Tanaka, Kurashiki, and Kenzi Tamaru, Kamakura, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Division of Ser. No. 295,907, Feb. 22, 1972, abandoned. This application Dec. 5, 1974, Ser. No. 529,930

Claims priority, application Japan, Oct. 11, 1971, 46-79425

Int. Cl.² C07C 3/58

U.S. Cl. 260—672 R 9 Claims

1. A process for hydrodealkylating an alkylaromatic compound comprising contacting an alkylaromatic compound and hydrogen at a temperature of from about 250°C. to about 400°C., with an electron donor-acceptor complex catalyst comprising (a) graphite and (b) an alkali metal, the weight ratio of the alkali metal to graphite of said catalyst being from 0.1 : 1 to 10 : 1.

3,975,455

ALTERING GAS PERMEABILITIES OF POLYMERIC MATERIAL

James R. Falender, Sanford; Sarah E. Lindsey, Midland; Andrew H. Ward, Midland, and Thomas C. Kendrick, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 3, 1973, Ser. No. 385,359

Int. Cl.² C08L 83/06, 83/10

U.S. Cl. 260—827 12 Claims

1. A method for altering the gas permeability of a polymeric material comprising irreversibly mechanically stressing said polymeric material in at least one direction at a suitable processing temperature and thereafter reducing the temperature within a suitable time period to retain molecular orientation within said polymeric material which had been oriented by said stressing and where oxygen gas permeability is increased, said polymeric material consisting essentially of a mixture of two perceptibly distinct phases wherein one phase is evenly distributed throughout a second phase in which said distributed phase is a polydiorganosiloxane wherein the organic groups are selected from the group consisting essentially of methyl, ethyl, vinyl, phenyl and 3,3,3-trifluoropropyl radicals where at least 50 percent of the organic groups are methyl or ethyl radicals and in which said distributed phase particles have diameters perpendicular to the longitudinal axis of less than 100 microns and in which one phase is present in an amount of at least 10 weight percent where the total weight of all the phases is 100 weight percent, said phases being polymeric materials which each have an elastic shear modulus of less than 10^9 dynes per square centimeter at processing temperature and which are flowable at processing temperatures, said polymeric materials of the phases being chemically dissimilar materials having oxygen gas permeabilities which differ by a factor of at least 10 wherein said gas permeabilities are in units of $cm^3(mil)/(24\ hr)\ (100\ in^2)\ (atm)$, one phase being a thermoplastic polymeric material which is a solid at ambient temperature, and said mixture retaining the above stated physical state on standing at ambient temperature over an extended period of time.

3,975,456

POWDER PAINT WITH EPOXY AND AMIDE COPOLYMER AND ANHYDRIDE

Santokh S. Labana, Dearborn Heights, and Stephen C. Peng, Utica, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 394,880, Sept. 6, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,472

Int. Cl.² C08L 63/10; C08F 18/14

U.S. Cl. 260—836 5 Claims

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, plasticizers, and flow control agents, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

A. a copolymer consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 40° to about 90°C. and a molecular weight (M_n) in the range of about 1500 to about 15,000, and

B. an anhydride crosslinking agent selected from the group consisting of

1. monomeric anhydrides of dicarboxylic acids, and

2. homopolymers of anhydrides of dicarboxylic acids,

and present in an amount that provides about 0.3 to about 1.2 anhydride groups for each functional group on said copolymer,

the improvement wherein said copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers se-

lected from the group consisting of acrylamide and methacrylamide in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1–C_8 monohydric alcohol and acrylic acid, esters of a C_1–C_8 monohydric alcohol and methacrylic acid and C_8–C_{12} monovinyl hydrocarbons.

3,975,457

THERMOPLASTIC EXTENSIBLE COATING COMPOSITIONS

Wen-Hsuan Chang, Gibsonia, and Samuel Porter, Jr., Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 399,596, Sept. 21, 1973, abandoned. This application Nov. 14, 1974, Ser. No. 523,780

Int. Cl.² C08L 75/08

U.S. Cl. 260—859 R 15 Claims

1. A storage-stable, ungelled, thermoplastic coating composition comprising the reaction product of:

A. 1–30 percent by weight of an organic polyisocyanate;

B. 4–50 percent by weight of a polymeric polyol having a glass transition temperature of less than about 50°C.; and

C. 30–95 percent by weight of an interpolymer having a hydroxyl value of about 60 or less derived from:

1. a hydroxyalkyl ester of an ethylenically unsaturated carboxylic acid; and

2. at least one copolymerizable ethylenically unsaturated monomer;

the NCO/OH equivalent ratio in said reactants being less than 1/1 and said reaction product having an intrinsic viscosity of 1.2 deciliters per gram or less.

3,975,458

GRAFT POLYMERS OF VINYL CHLORIDE ON UNSATURATED OLEFINIC ELASTOMERS AND PROCESS FOR THE PREPARATION THEREOF

Febo Severini; Alberto Valvassori, both of Milan, and Alberto Pagliari, Saronno, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Division of Ser. No. 292,159, Sept. 25, 1972, Pat. No. 3,891,720. This application Dec. 9, 1974, Ser. No. 531,080

Claims priority, application Italy, Sept. 23, 1971, 28984/71

Int. Cl.² C08L 51/00, 27/06

U.S. Cl. 260—876 R 5 Claims

1. An impact resistant polymeric composition comprising a mixture of the following components:

a. a preformed vinyl chloride homopolymer, and

b. a crude graft product obtained by grafting vinyl chloride onto an elastomeric copolymer of ethylene, an α-olefin and a minor amount of a cyclic or acyclic diene or polyene, said crude graft product comprising (1) vinyl chloride homopolymer, (2) a graft copolymer of vinyl chloride on an elastomeric copolymer, said graft copolymer comprising from 15 to 60% by weight of vinyl chloride, and (3) an unmodified elastomeric copolymer;

said composition having a melt index (determined according to ASTM D 1238 at 185°C. with a load of 23.5 kg.) greater than 1, and containing from 5 to 15% of total rubber, which is defined as the sum of the amounts of elastomeric copolymer contained in components (2) and (3) of the crude graft product.

3,975,459

THERMOPLASTIC MOLDING COMPOSITIONS OF HIGH IMPACT RESISTANCE

Franz Schmidt, Mannheim; Gerhard Fahrbach, Plankstadt; Wolfgang Schenk, Schwetzingen, and Erhard Seiler, Freiburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 14, 1975, Ser. No. 568,144

Claims priority, application Germany, Apr. 26, 1974, 2420300

Int. Cl.² C08L 53/00

U.S. Cl. 260—876 B 1 Claim

1. Impact-resistant thermoplastic molding compositions containing

from 70 to 97% by weight of a polyoxymethylene and

from 30 to 3% by weight of a block copolymer of a diene polymer block B and at least one poly(alkylmethacrylate) block A.

3,975,460

BLENDS OF CERTAIN HYDROGENATED BLOCK COPOLYMERS WITH ABS POLYMERS

Sol Davison, and Michael Wales, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 300,930, Oct. 26, 1972, abandoned. This application Apr. 24, 1975, Ser. No. 571,348

Int. Cl.² C08L 51/00, 53/00

U.S. Cl. 260—876 B 5 Claims

1. A composition comprising

a. 100 parts by weight of a block copolymer having at least two polymer blocks A and at least one polymer block B, each polymer block A being selected from the group consisting of monoalkenyl arene polymers and hydrogenated products thereof wherein no more than about 25% of the aromatic double bonds having been reduced, and polymer block B being a hydrogenated polymer block of a $C_{4\text{-}5}$ conjugated diene wherein at least about 80% of the aliphatic unsaturation of the block has been reduced by hydrogenation; and

b. 5–90 parts by weight of an interpolymer of

	% by Weight
Diene rubber	5–60
Acrylonitrile	5–50
Alkenyl aromatic monomer	25–85.

3,975,461

PROCESS FOR PREPARING A GRAFT COPOLYMER

Takeshi Yamawaki, Komae; Masahiro Hayashi, Yokohama, and Kazuo Endo, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 159,468, July 2, 1971, abandoned. This application Jan. 11, 1974, Ser. No. 432,585

Claims priority, application Japan, Nov. 14, 1970, 45-100518

Int. Cl.² C08F 257/02, 265/04, 267/08, 279/02

U.S. Cl. 260—879 10 Claims

1. A product prepared by the process for preparing a graft copolymer consisting essentially of

A. copolymerizing acrylonitrile or methacrylonitrile or a mixture thereof with an alkyl vinyl ether containing C_1–C_4 alkyl groups, in the presence of

B. a homopolymer of a conjugated diene or a copolymer containing at least 50%, by weight, of said conjugated diene and a vinyl monomer, using

C. potassium persulfate as a catalyst in an emulsion medium, with

D. n-dodecyl mercaptan, t-dodecyl mercaptan or di-isopropyl xanthogen disulfide as a chain transfer agent,

E. at a polymerization temperature during the graft polymerization of from 0° to 100°C,

said nitrile being present in an amount of from 60 to 95 %, by weight, based on the total weight of said nitrile and said alkyl vinyl ether, and the total amount of said nitrile and said alkyl vinyl ether being present in an amount of from 3–50 times by weight the quantity of said homopolymer or copolymer.

3,975,462
PIPERIDINE-SPIRO-HYDANTOIN DERIVATIVES AND THEIR USE AS STABILIZERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayou Ohsawa, all of Hiro, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

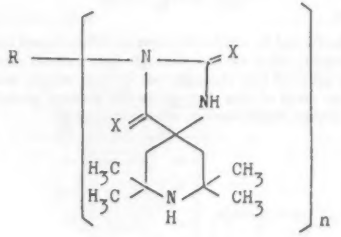
Continuation-in-part of Ser. No. 366,575, June 4, 1973, abandoned, which is a continuation of Ser. No. 265,313, June 22, 1972, abandoned. This application Oct. 22, 1974, Ser. No. 517,008

Claims priority, application Japan, July 2, 1971, 46-48646

Int. Cl.² C08K *5/34, 5/51*

U.S. Cl. 260—880 R **16 Claims**

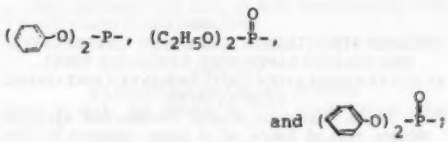
1. A synthetic polymer composition stabilized against photo and thermal deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



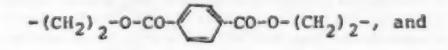
(I)

wherein X represents oxygen atom or sulfur atom; n is an integer of 1 to 4 inclusive; and R represents,

when *n* is 1, an alkenyl group which may be substituted with halogen, an alkynyl group which may be substituted with phenyl, an aralkyl group which may be substituted with halogen, alkyl of 1 to 4 carbon atoms or halomethyl, a hydroxyalkyl group, an alkoxyalkyl group, an alkenyloxyalkyl group, an aryloxyalkyl group, an alkylthioalkyl group, and acyloxyalkyl group, an epoxyalkyl group, an N-alkyl-substituted aminoalkyl group, an alkoxycarbonylalkyl group, an aryloxycarbonylalkyl group, an alkoxycarbonyl group, $(C_2H_5O)_2$—P—,

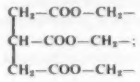


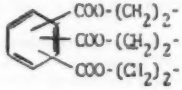
when n is 2, an alkenylene group of 4 to 18 carbon atoms, a dialkyleneether group, an aralkylene group, $-(CH_2)_2-O-CO-CO-O-(CH_2)_2-$, $-(CH_2)_2-O-CO-(CH_2)_2-CO-O-(CH_2)_2-$, $-(CH_2)_2-O-CO-(CH_2)_4-CO-O-(CH_2)_2-$,

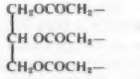


$-CH_2-CO-O-(CH_2)_2-O-CO-CH_2-$;

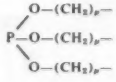
when n is 3,





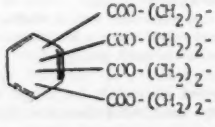


or a group of the formula



in which *p* is an integer of 1 to 8 inclusive and *p*'s may be the same or different, and,

when *n* is 4,



3,975,463

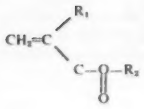
MOLDED STRUCTURES CONTAINING CRYSTALLING POLYOLEFIN SAPONIFIED ETHYLENE VINYL ACETATE COPOLYMER AND CARBONYL CONTAINING COPOLYMERS

Sadao Hirata, Yokohama; Muneki Yamada, and Akira Kishimoto, both of Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Division of Ser. No. 261,804, June 12, 1972, Pat. No. 3,857,754. This application Aug. 9, 1974, Ser. No. 496,323
Claims priority, application Japan, June 18, 1971, 46-43356; Jan. 14, 1972, 47-5810
Int. Cl.² C08L 23/00
U.S. Cl. 260—897 B 8 Claims

5. A resinous molded structure obtained by melt-extrusion molding a resinous composition which comprises (A) 30 to 98 % by weight of a crystalline polyolefin (B) 2 to 70% by weight of a saponified product of an ethylene-vinyl acetate copolymer having an ethylene content of 25 to 50 mole %, a degree of saponification of at least 99% and an intrinsic viscosity (η), measured at 30°C. in a mixed solvent of 85% by weight of phenol and 15% by weight of water, of from 0.07 to 0.17 l/g and (C) 0.5 to 15 parts by weight, per 100 parts by weight of said polyolefin and ethylene-vinyl acetate copolymer saponified product, of a thermoplstic polymer having carbonyl groups in an amount of 120 to 1400 milliequivalents per 100 g of the polymer (C), said thermoplastic polymer (C) being selected from the group consisting of

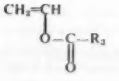
i. polymers composed of a monomer expressed by the following formula



wherein R_1 is a hydrogen atom or a lower alkyl group of up to 4 carbon atoms, and R_2 is a hydrogen atom or an alkyl group of 1 to 12 carbon atoms.

copolymers of said monomer with an olefin, and copolymers of said monomer with other α,β-ethylenically unsaturated monomer,

ii. polymers composed of a monomer expressed by the following formula



wherein R_3 is a hydrogen atom, or an alkyl group of up to 4 carbon atoms or a phenyl group,

copolymers of said monomer with an olefin, and copolymers of said monomer with other α,β-ethylenically unsaturated monomer free of a carbonyl group,

iii. an ionomer, and

iv. a copolymer of maleic anhydride with other α,β-ethylenically unsaturated monomer free of a carbonyl group.

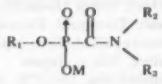
3,975,464

CARBAMOYLPHOSPHONATES

William P. Langsdorf, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 478,968, June 13, 1974, which is a division of Ser. No. 283,769, Aug. 25, 1972, Pat. No. 3,846,512, which is a continuation-in-part of Ser. No. 85,221, Oct. 29, 1970, Pat. No. 3,819,353, which is a continuation-in-part of Ser. No. 803,962, March 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 731,732, May 24, 1968, Pat. No. 3,627,507. This application Feb. 24, 1975, Ser. No. 552,035
Int. Cl.² C07C 9/02
U.S. Cl. 260—923 2 Claims

1. A compound of the formula:



wherein:

R_1 is alkyl of one through six carbon atoms, chloroalkyl of one through six carbon atoms containing up to three chlorine atoms, bromoalkyl of one through six carbon atoms containing up to three bromine atoms, alkoxy alkyl of three through seven carbon atoms, alkenyl of two through six carbon atoms, alkynyl of three through four carbon atoms, phenyl or benzyl;

R_2 is hydrogen or methyl;

R_3 is NH_2, $NHCH_3$ or $N(CH_3)_2$;

M is selected from the group consisting of ammonium, hydrogen, sodium, lithium, potassium, calcium, magnesium, manganese, barium or

where R_6, R_7 and R_8 can be the same or different and each can be hydrogen, alkyl of one through four carbon atoms, or hydroxy alkyl of two through four carbon atoms; and R_9 is hydrogen, alkyl of one through twelve carbon atoms, allyl, benzyl, amino, methylamino, or dimethylamino.

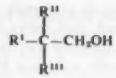
3,975,465

HETEROCYCLIC PHOSPHORUS COMPOUNDS

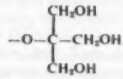
John Scotchford Elliott, Beaconsfield; Bryan Terence Davis, Wakingham, and Monty Frederick Crook, Binfield, all of England, assignors to Edwin Cooper & Company Limited, Bracknell, England

Division of Ser. No. 332,125, Feb. 13, 1973, Pat. No. 3,891,726. This application Mar. 17, 1975, Ser. No. 558,809
Claims priority, application United Kingdom, Feb. 18, 1972, 7582/72
Int. Cl.² C07F 9/32
U.S. Cl. 260—927 R 11 Claims

1. A heterocyclic phosphorus mono- or polyester product prepared by reacting a polyol of the formula:



wherein R′ is selected from the group consisting of hydrogen, methyl, ethyl, methylol, the group -O(R″″-O)$_v$H where R″″ is ethylene or propylene and v is zero or an integer of from 1 to 10, and



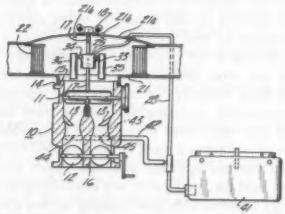
R″ and R‴ are the same or different and each is selected from the group consisting of hydrogen, methyl, ethyl and methylol, and the combination of R′, R″ and R‴ is such that at least two hydroxyl groups are present; or a monether, oxide, oxetane or carbonate which yields said polyol on hydrolysis; with a heterocyclic phosphorus compound prepared by reacting an olefin polymer or copolymer having a molecular weight in the range of about 700 to 3500 and containing olefinic unsaturation with a phosphorus trihalide in the presence of a Friedel-Crafts catalyst to form a reaction product having hydrocarbon and halogen attached to phosphorus, and thereafter reacting the reaction product with water or methanol to remove one or both of the halogen atoms from the phosphorus atom; and further reacting the reaction product of said polyol and heterocyclic phosphorus compound with a hydrocarbon dicarboxylic acid, or an anhydride or ester thereof.

3,975,466

CARBURETOR AUXILIARY FLUID INJECTOR

George W. Bradshaw, Detroit, Mich., assignor to Peter Lilicy and Peter G. Lilicy, both of Southgate, Mich., part interest to each

Filed Apr. 10, 1975, Ser. No. 566,660
Int. Cl.² F02M *25/04*
U.S. Cl. 261—18 A **6 Claims**



1. An attachment for introducing a fluid to the air intake of a carburetor of an internal combustion engine having an air filter and fuel injector nozzles, said attachment being for mounting within said air filter and comprising:

a source of said fluid;

at least one open-ended barrel having a through bore;

means for holding said barrel in the air intake of said carburetor in a position whereby said barrel is axially parallel with the direction of air flow to said carburetor; and

means for conveying said fluid from said source of fluid to the bore of said barrel whereby the passage of carburetor intake air through said bore draws said fluid into said bore where it is atomized and vaporized;

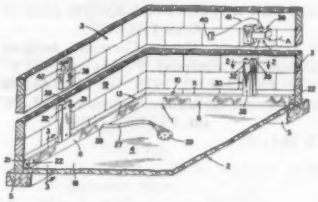
wherein said holding means includes a mounting member having an aperture axially parallel to said barrel for mounting said member on a support rod and said means for conveying fluid to the bore of said barrel is a rigid hollow tube having an end leading into the bore of said barrel and another end connected to said mounting member, said other end being in fluid communication with said source of said fluid.

3,975,467

BASEBOARD DRAINAGE SYSTEM

Nevitt S. Beck, 260 Bonnett St. SW., North Canton, Ohio 44720

Filed July 28, 1975, Ser. No. 599,788
Int. Cl.² E04B *1/70;* **E04F** *17/00*
U.S. Cl. 261—30 **14 Claims**



1. A drainage system for use in an area having at least a wall and adjoining floor including;

a. a generally L-shaped sheet metal member having a base flange and an upstanding leg flange having orifice means therein; said member being adapted to be mounted on the floor adjacent the wall of the area;

b. sealing means adapted to seal the base flange with respect to the floor;

c. fastening means adapted to secure the base flange to the floor, with the upstanding leg flange being spaced from the wall to form a drainage channel with said wall and floor; and

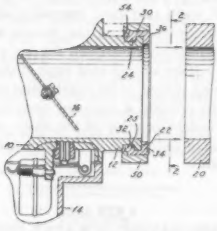
d. top closure means removably mounted on the upstanding leg flange and extending across the drainage channel and engageable with the wall to form a removable top closure for the drainage channel.

3,975,468

MOUNT FOR CARBURETORS

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Oct. 21, 1974, Ser. No. 516,462
Int. Cl.² F02M *17/00;* **F02B** *77/00;* **F16L** *23/00*
U.S. Cl. 261—65 **5 Claims**



1. A carburetor mount assembly for cantilever mounting of a carburetor on an engine to reduce heat and vibration transmission which comprises:

a. a neck portion on the carburetor to be fastened to an engine, said neck portion having an annular surface groove spaced from the end of the neck portion and a face surface on the end of the neck portion,

b. an elastic ring surrounding said neck portion having an annular flange portion interfitting within said groove and

a radially inwardly extending portion overlying said face surface, and

c. a clamping ring adapted to be fastened interfacially to an engine surrounding said elastic ring having an inner annular portion to engage axially with the said elastic ring on a radial surface to exert an axial pressure thereon adjacent said annular flange portion in a clamping position and an axially extending portion overlying and confining said ring between said radial surface and said end portion of said neck portion.

3,975,469

DEVICE FOR REVOLVING LIQUIDS AND SUPPLYING GAS THERETO

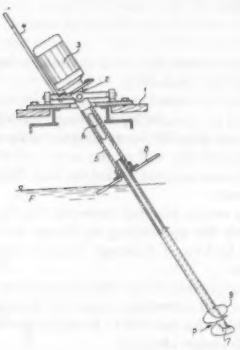
Hubert K. Σ. Fuchs, Mayen, Germany, assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Jan. 17, 1975, Ser. No. 542,040

Claims priority, application Austria, Jan. 23, 1974, 536/74

Int. Cl.² B01F *3/04*

U.S. Cl. 261—87 **11 Claims**



1. In combination with a body of liquid, a device for supplying gas to said liquid and revolving the liquid, said device comprising a hollow shaft for supplying gas to the liquid and having a free lower end portion provided with a gas outlet immersed in the liquid, means to supply gas to the hollow shaft, a propeller carried by said free end portion of the shaft, and means to drive said propeller for revolving the liquid said propeller including at least two screw-shaped vanes, at least a part of the surface of each vane forming an acute angle with the longitudinal axis of the hollow shaft, as seen from the free end of the shaft, each said vane extending along at least two thirds of the circumference of the hollow shaft, said vanes being uniformly distributed around the circumference of the hollow shaft, a surface of one said vane at the free end of the hollow shaft being joined at its outer edge to a surface of an adjacent vane to provide a rounded concave surface facing away from the hollow interior of the shaft, said concave surface being situated radially a distance outside the outer surface of said shaft.

3,975,470

HUMIDIFIER HAVING A WATER DISTRIBUTOR TROUGH

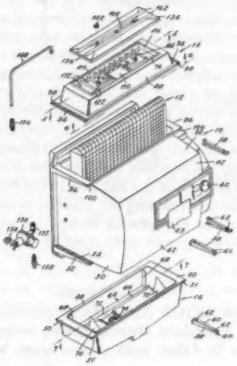
Lewis O. Engel, Mount Clemens, Mich., assignor to General Filters, Inc., Novi, Mich.

Filed May 8, 1974, Ser. No. 467,852

Int. Cl.² B01F *3/04*

U.S. Cl. 261—106 **6 Claims**

1. A humidifier adapted to be connected to an air system comprising a housing having means providing communication with the air system, and evaporator pad mounted in said housing, water distribution means disposed above said evaporator pad for providing a substantially uniformly distributed flow of water to said evaporator pad, said water distribution means comprising an elongated rectangular tray having a bottom wall and upright side and end walls, said tray having a portion of its bottom wall midway between and spaced from said end walls and also spaced from one of said side walls which is separated from the remaining portion of said bottom wall by internal upright wall elements to provide a water reservoir, said reservoir being defined in part by the other of said side walls, said internal wall elements being spaced from said one side wall, a plurality of longitudinally spaced apertures formed in the bottom wall of said tray in the portion thereof outside said reservoir in a continuous row along said one side wall from one end wall to the other, additional internal upright wall elements extending along said bottom wall in the portion



thereof outside said reservoir providing channels from said internal wall elements to said respective apertures, metering passages in said first mentioned internal wall elements respectively placing said channels in communication with said water reservoir, the bottom of said reservoir being elevated in relation to the portion of said bottom wall outside said reservoir, said housing having a top opening, first means for removably securing said tray over said top opening, said housing having a bottom opening, a cover for said bottom opening, second means for removably securing said cover over said bottom opening, said tray and cover being interchangeable, and said first and second securing means being adapted to secure said tray over said bottom opening and said cover over said top opening when said tray and cover are interchanged so that the humidifier may be used with said housing turned upside down.

3,975,471

PROCESS FOR THE PRODUCTION OF FUEL COMBINED ARTICLES FOR ADDITION IN BLOCK SHAPED HIGH TEMPERATURE FUEL ELEMENTS

Milan Hrovat, Rodenbach, and Lothar Rachor, Kleinauheim, both of Germany, assignors to Hobeg Hochtemperaturreaktor-Brennelement GmbH, Germany

Filed July 17, 1974, Ser. No. 489,436

Claims priority, application Germany, July 27, 1973, 2338155

Int. Cl.² G21C *21/00*

U.S. Cl. 264—.5 **10 Claims**

1. In a process for the production of fuel compacts consisting of an isotropic, radiation resistant graphite matrix of good heat conductivity and having embedded therein coated particles of the group consisting of (1) coated fuel particles, (2) coated fertile particles and (3) a mixture of coated fuel particles and coated fertile particles for insertion in high tempera-

ture fuel elements of the coated particles (1), (2) or (3) being overcoated with a molding composition consisting essentially of graphite powder and a binder of a thermoplastic resin capable of being hardened the improvement comprising providing only the outer surface of the overcoat with a hardener for the resin and a lubricant and subsequently compressing in a mold at a constant temperature of about 150°C. and removing the hardened and finished compacts therefrom.

3,975,472

PROCESS AND DEVICE FOR PREPARING PRILLS

Mathijs W. Packbier, and Kees Jonckers, both of Sittard, Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jan. 29, 1975, Ser. No. 545,163
Claims priority, application Netherlands, Feb. 1, 1974, 7401406
Int. Cl.² B01J 2/04
U.S. Cl. 264—14 4 Claims

1. In a process for preparing solid granules from molten material which includes

a. spraying drops of said molten material vertically downwardly from the upper end of a vertical tower through which a gas current flows upwardly.

b. introducing said gas into the bottom of said tower to cool and solidify at least the outside of the drops while the same fall through an upper section of said tower, and further cool said drops to form solid granules during their fall below said upper section, and

c. discharging said granules from the bottom of said tower,

the improvement comprising:

d. passing only a portion of said introduced gas through said upper section of said tower,

e. passing said portion of gas from said upper section to a contamination-removal zone, and

f. discharging the remainder of said introduced gas from said tower before said remainder enters said upper section.

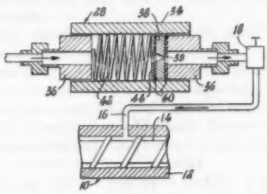
3,975,473

PROCESS FOR PRODUCTION OF CELLULAR THERMOPLASTIC BODIES

William P. Mulvaney, Sommerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 505,274, Sept. 12, 1974, abandoned. This application June 4, 1975, Ser. No. 583,663
Int. Cl.² B29D 27/00; B29F 1/06, 3/06
U.S. Cl. 264—23 16 Claims

1. In the process for the production of a cellular thermoplastic body, wherein solid thermoplastic material is melted under pressure in an extruder, a gaseous blowing agent is injected into the molten thermoplastic material under pressure and admixed and through the mixture of said molten thermoplastic material and said gaseous blowing agent is passed to a zone of reduced pressure to effect the cellular expansion of said thermoplastic material by said gaseous blowing agent, the improvement which comprises metering said gaseous blowing



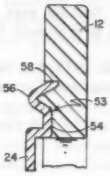
agent at sonic velocity at a point upstream of the injection of said blowing agent into said molten thermoplastic material.

3,975,474

VIEWER

Conrad L. Leblanc, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Mar. 1, 1973, Ser. No. 337,245
Int. Cl.² B06B 3/00; B29C 27/08
U.S. Cl. 264—23 6 Claims



1. A method for fabricating a viewer comprising placing a sheet of thermoplastic lens material in overlying and overlapping relationship to a frame, said frame having a lens opening therein and being formed of thermoplastic material heat sealable to said lens material;

contacting said sheet of lens material with a metallic horn of an ultrasonic energy transfer device, said horn having a downwardly extending cutting edge extending about its periphery and a substantially planar portion located inwardly from said cutting edge;

causing penetration of said sheet of thermoplastic lens material during an initial portion of a downward stroke of said horn by said cutting edge to ultrasonically cut a shaped lens from said sheet of thermoplastic material without penetrating completely through said frame;

causing, during a further portion of said downward stroke of said horn, said substantially planar portion on said horn to contact the sheet of lens material and impart kinetic energy thereto and to said frame causing the ultrasonically sealing of the shaped lens about the edges of said opening in said frame for said lens.

3,975,475

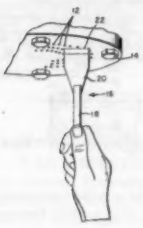
WIPING SPINNERET FACE WITH COOLED WIPER

Joe Alvin Foley, Ridgeway, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1974, Ser. No. 533,533
Int. Cl.² B08B 13/00; B28B 7/04
U.S. Cl. 264—28 4 Claims

1. In a melt spinning process that includes the steps of extruding a molten polymeric material under pressure through holes formed in the face of a spinneret and periodically wiping the face of the spinneret with the blade of a wipe stick to remove deposits of decomposed polymeric material, the im-

provement comprising: cooling the blade of the wipe stick to a temperature below 0°C. before using thereby reducing the



tendency of smearing the molten polymeric material across the face of the spinneret during wiping.

3,975,476

METHOD FOR BUILDING A CABLE-STAYED GIRDER BRIDGE

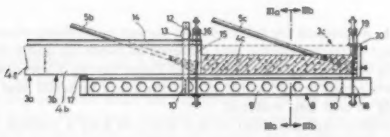
Klemens Finsterwalder, Socking near Starnberg, Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Mar. 18, 1975, Ser. No. 559,490

Claims priority, application Germany, Mar. 22, 1974, 2413815

Int. Cl.² E04B *1/16*

U.S. Cl. 264—33 **1 Claim**



1. A process for the construction of a deck structure in a cable-stayed girder bridge, by sequential formation in successive adjacent sections of a plurality of concrete deck girders each of which include longitudinally extending stiffening girders and a laterally extending deck portion, said bridge including pylons anchored in the earth to support said concrete deck girders from cables extending between said pylons and said longitudinal stiffening girders, comprising the steps of providing a form carrier adaptable to have concrete poured thereinto to form said deck girders, arranging said form carrier to be cantilevered longitudinally from and below a previously formed deck girder section to provide support for a successive deck girder section during formation thereof, first forming said longitudinal stiffening girders for said successive deck girder section with cables embedded therein, subsequently tensioning said embedded cables between said pylons and said formed longitudinal stiffening girders to provide support therefor, thereafter connecting said form carrier to said formed stiffening girders to thereby provide further support therefor from said previously tensioned cables, thereafter forming said laterally extending deck portion of said successive girder section, subsequently moving said form carrier to be cantilevered longitudinally from said deck girder section thus formed, and thereafter repeating said steps to form said deck structure from said successive adjacent deck girder sections.

3,975,477

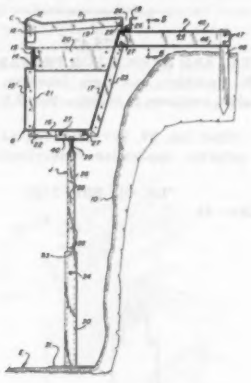
METHOD OF INSTALLING THE COPING AND GUTTER OF A RIM FLOW SWIMMING POOL

Victor D. Molitor, 2829 S. Santa Fe Drive, Englewood, Colo. 80110

Filed Oct. 25, 1974, Ser. No. 517,852

Int. Cl.² E04B *1/16*

U.S. Cl. 264—35 **1 Claim**



1. In a method of installing a coping and gutter assembly of a rim flow swimming pool having an upper front nose which determines the level of water in the pool and means for draining, into said gutter, water which overflows said nose, the steps including:

supporting said assembly, at spaced positions on the underside thereof, in an excavation for said swimming pool by adjustable supporting devices each placed below the approximate lateral center of gravity thereof;

determining the elevation of an upper edge of said assembly at points generally above said supporting devices;

adjusting said supporting devices in order to obtain a desired level;

providing rearwardly extending gussets attached to the rear side of said assembly for tipping said assembly laterally at said supporting devices;

tipping said assembly about said supporting devices to produce a desired elevation of the rear of said assembly relative to the front thereof;

locking said gussets in said adjusted positions;

pouring concrete or the like to form a wall of said swimming pool; and

embedding said supporting devices and said gussets in said concrete.

3,975,478

METHOD FOR PRODUCING HIGHLY PERMEABLE ACRYLIC HOLLOW FIBERS

Richard L. Leonard, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 14, 1974, Ser. No. 497,437

Int. Cl.² B29D *27/00*; D01F *6/18*

U.S. Cl. 264—41 **9 Claims**

1. A method for forming an asymmetric hollow acrylic fiber having an axially disposed cylindrical bore extending throughout the fiber length and characterized by a high permeability and selectivity when used as a separatory membrane, the method which comprises: extruding a solution of fiber-forming acrylic polymer which contains at least 70 percent by weight acrylonitrile through a shaping orifice to form a hollow fiber while simultaneously injecting a coagulating fluid into the fiber bore as it is formed, causing the extruded fiber to contact a coagulation bath maintained at a temperature of

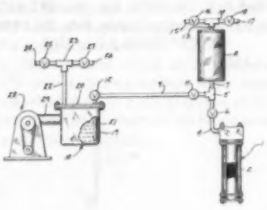
from about 60° to 80°C. immediately upon exiting from said shaping orifice and thereafter washing said hollow fiber with water to remove residual solvent.

3,975,479

METHOD OF FABRICATING A REINFORCED PLASTIC ARTICLE

William George McClean, Milwaukee, Wis., assignor to McClean Anderson, Inc., Milwaukee, Wis.

Filed Mar. 9, 1973, Ser. No. 339,920
Int. Cl.² B29H 9/02
U.S. Cl. 264—102 6 Claims



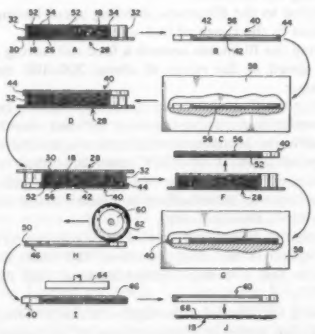
1. A method of producing a reinforced plastic article, comprising the steps of disposing a layer of fibrous material within a closed mold, disposing a finely divided reinforcing material in said mold as a second layer separate from said first named layer, evacuating the mold to remove gas from the interior of the mold and from said materials, removing gas from an uncured liquid binder, introducing the degassified binder into the mold while maintaining an evacutated condition in said mold, applying pressure to the binder in excess of the pressure in the mold to drive the binder into the materials and thoroughly impregnate the same, and curing the binder while maintaining a pressure on said binder in excess of the pressure in the mold to provide an integrally bonded article.

3,975,480

METHOD OF MAKING ORNAMENTAL PLASTIC ARTICLES

Ben Walters, 4600 11th Ave., Hialeah, Fla. 33013

Filed Oct. 24, 1974, Ser. No. 517,468
Int. Cl.² B29C 9/00
U.S. Cl. 264—113 6 Claims



1. A process for producing an ornamental plastic article having a predetermined outer configuration comprising:

a. providing a first mold surface having an outer wall of said predetermined configuration generally perpendicular to said surface;

b. providing at least one second wall extending from the first mold surface within said outer wall to define a corresponding pocket for plastic particles;

c. forming the upper edge of said second wall to a predetermined shape;

d. providing plastic particles on said mold surface and within said outer wall of one color;

e. providing plastic particles of a color different from said first color on said mold surface and within said pocket;

f. depositing on a second mold surfae, a thin layer of thermo-plastic composition in a finally divided state;

g. heating said layer on said second mold surface to cause the layer to fuse and become tacky;

h. superposing said second mold surface in position with respect to said first mold surface with the tacky layer facing the sources of particles on said first mold surface;

i. positioning said first and second mold surfaces so that said second mold surface is below said first mold surface to cause said sources of plastic particles to contact the tacky surface at pre-selected areas;

j. removing said second mold surface from said first mold surface;

k. heating said particles on the tacky layer to cause them to become soft without complete coalescence thereof to form a layer of said particles upon said first layer and be bonded thereto;

l. cooling said particle layer and said first layer to form a coherent surface covering said second mold surface; and

m. removing said coherent surface covering from second mold surface, whereby an article of the desired configuration having various designs therein is formed.

3,975,481

METHOD FOR MOLDING ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE MOLDING POWDER

Eugene R. Baumgaertner, Florham Park, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 311,062, Dec. 1, 1972, Pat. No. 3,847,888.
This application June 27, 1974, Ser. No. 483,745
Int. Cl.² B27J 5/00
U.S. Cl. 264—126 4 Claims

1. The method for making solid articles of ultra-high molecular weight polyethylene powder comprising:

a. compressing said powder having a molecular weight of at least 1×10^6 and a density from 0.92 to 0.99 gm./cc. comprising particles of less than 100 micron mean particle size having a distribution function of less than 0.80 under a pressure of at least 2,000 p.s.i. at a temperature below the crystalline melting point of the polyethylene to form a solid preform,

b. releasing the pressure,

c. free-sintering the preform at a temperature above said crystalline melting point for a time sufficient to allow sintering into an article having the tensile strength and elongation set forth hereinbelow, and

d. cooling said preform to ambient temperatures to thereby form a solid article having a tensile strength of at least 4,000 p.s.i. and elongation of at least 200 percent.

3,975,482

PROCESS FOR DRAWING ACRYLIC FIBROUS MATERIALS TO FORM A PRODUCT WHICH PARTICULARLY IS SUITED FOR THERMAL STABILIZATION AND CARBONIZATION

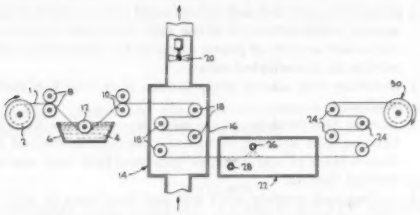
Richard N. Rulison, Medfield, Mass., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 265,033, June 21, 1972, abandoned. This application June 10, 1974, Ser. No. 477,971
Int. Cl.² B29C 25/00; B28B 11/06
U.S. Cl. 264—131 12 Claims

1. In a continuous process for the drawing of an acrylic multifilament fibrous material selected from the group consisting of an acrylonitrile homopolymer and an acrylonitrile

copolymer containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith wherein a continuous length of said multifilament fibrous material is continuously passed for a brief residence time through a drawing zone provided at a temperature of about 100° to 175°C. while under the influence of a longitudinal tension wherein said continuous length of multifilament fibrous material is elongated while undergoing no substantial thermal stabilization; the improvement comprising:

a. passing said continuous length of acrylic fibrous material prior to said drawing through a liquid medium containing a dispersion of powdered graphite so as to coat the surface of the individual filaments of said fibrous material with said liquid medium, and



b. passing said resulting continuous length of acrylic multifilament fibrous material bearing said coating of said liquid medium thereon through a drying zone wherein the liquid portion of said medium is substantially expelled and the surface of the filaments is provided with a coating of said powdered graphite wherein an uptake of powdered graphite of about 0.5 20 percent by weight based upon the weight of the fibrous material is accomplished with said powdered graphite serving to improve the drawing properties of said acrylic multifilament fibrous material and aiding in the formation of an elongated multifilament fibrous material which is particularly suited for thermal stabilization and carbonization to form a multifilament carbonaceous fibrous material.

3,975,483

PROCESS FOR MANUFACTURING STRATIFIED MATERIALS

Bernard Rudloff, Marckolsheim (Bas-Rhin), France

Continuation-in-part of Ser. No. 657,045, July 31, 1967, abandoned. This application Nov. 6, 1970, Ser. No. 87,605
Claims priority, application France, Jan. 12, 1967, 67.8792
Int. Cl.² B29B *3/00*
U.S. Cl. 264—137 **11 Claims**

1. The process for the manufacture of rigid and flexible stratified shaped fiber-reinforced plastic articles comprising

impregnating a layer of fibers with at least two different resins in powder form, the first of said resins being characterized by hardening as a result of being heated to a temperature between about 60°C and 100°C, and the second of said resins being characterized by hardening as a result of being heated to a temperature between about 110°C and 200°C at a pressure between about 400 and 600 kg. per sq. cm., to form a resin impregnated fiber sheet;

heating said resin impregnated fiber sheet at a temperature between about 60°C and 100 °C sufficient to harden said first resin powder thereby strengthening said resin impregnated fiber sheet sufficient so that it may be cut and handled without disintegration thereof;

cutting the strengthening resin impregnated fiber sheet to form shaped sections of resin impregnated fiber sheet;

positioning at least one of said shaped sections of resin impregnated fiber sheets in a mold and heating to a temperature between about 110°C and 200°C and applying a pressure of between about 400 and 600 kg. per sq. cm., to form a stratified shaped fiber-reinforced plastic article; and

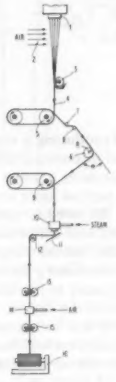
cooling said stratified shaped fiber-reinforced plastic article.

3,975,484

MANUFACTURE OF CRIMPED POLYAMIDE FILAMENTS YARN

Reisuke Okada, Okazaki; Hiroshi Okuno, Aichi, and Toshio Fukama, Okazaki, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 24, 1975, Ser. No. 552,417
Claims priority, application Japan, Feb. 26, 1974, 49-21915
Int. Cl.² D01D *5/22, 5/12*
U.S. Cl. 264—168 **20 Claims**



1. A process for the manufacture of a crimped polyamide filament yarn in which spinning, drawing and crimping are performed continuously, said process comprising:

a. melt-spinning a polyamide into a plurality of undrawn filaments through a spinneret having non-circular cross section spinning holes,

b. cooling the filaments,

c. applying to the filaments an oiling agent having a water content in the range of 0–5 weight percent,

d. passing the filaments around a feed roll having a peripheral speed in the range of about 200–400 meters per minute,

e. passing the filaments in contact with a heated body using a contact angle between about 80° and about 160° on which body the surface temperature is maintained in the range of about 170°–250°C and the radius of surface curvature is in the range of about 15–75 millimeters for imparting one-sided heating to cause a latent crimp, and drawing to the filaments,

f. passing the filaments around a draw roll having a peripheral speed in the range of about 800–1600 meters per minute and a surface temperature of less than about 220°C,

g. passing the filaments through a steam jet which is supplied with steam at a temperature in the range of about 200°–350°C, and about 3–15 kilograms per square centimeter gage pressure, with about 20–100% overfeed of said filaments to said steam jet, whereby a direct crimp is introduced into the filaments and the latent crimp in the filaments is brought out, and

h. winding up the filaments.

3,975,485

PRODUCTION OF FILMS AND SHEETS OF POLYESTER-POLYCARBONATE BLENDS

Phillip Stuart Bolien, Auburn; Surendra A. Amin, Pottsville, both of Pa., and William Sacks, Gillette, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 489,017, July 16, 1974. This application Jan. 7, 1976, Ser. No. 647,255

Int. Cl.² B29C *17/04*; B29F *3/012*

U.S. Cl. 264—171 8 Claims

1. A process of forming a film or sheet capable of being thermoformed into a shaped article, said process comprising the steps of:

a. blending about 60 to 85 parts by weight of a polyethylene terephthalate having an intrinsic viscosity of at least about 0.90 with correspondingly about 40 to 15 parts by weight of a polycarbonate,

b. extruding the resultant blend at a temperature above about 500°F onto a moving support while maintaining the surface of said support at a temperature of about 225° to 380°F whereby a film or sheet of the blend is formed and

c. collecting said film or sheet.

3,975,486

PROCESS FOR PRODUCING ANTI-PILLING ACRYLIC FIBER

Hideto Sekiguchi; Masao Sone, and Mitsunori Sato, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Sept. 13, 1973, Ser. No. 396,777

Claims priority, application Japan, Sept. 14, 1972, 47-92343

Int. Cl.² D01F *6/18*

U.S. Cl. 264—182 3 Claims

1. A process for producing an anti-pilling acrylic fiber which comprises dissolving an acrylonitrile polymer in a rhodanide solvent to prepare a spinning solution, wherein a rhodanide solvent in the spinning solution is 40–70%, subjecting the spinning solution to wet-spinning by extrusion through spinneret orifices into a coagulation bath containing a rhodanide solvent in an amount of 50–70% of that in the spinning solution, while maintaining the linear velocity ratio of free extrusion at 1 or higher, and the jet stretch ratio 1.5 or higher, stretching the formed gel fibers 3–7 times the length in hot water or in a heated steam medium at 80°–120°C, drying the stretched fibers and then subjecting the fibers to a relaxation treatment in a hot air current at a temperature of 150°C or lower or in a wet heat atmosphere at a temperature of 120°C or lower, said jet stretch ratio being the quotient obtained by dividing the takeup speed of the coagulated filaments from the coagulation step by the linear velocity of extrusion of the spinning solution through the spinneret orifices.

3,975,487

PROCESS FOR SPINNING HIGH MODULUS OXYBENZOYL COPOLYESTER FIBERS

Steve G. Cottis, Amherst; James Economy, Eggertsville, and Luis C. Wohrer, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,823

Int. Cl.² D01D *5/12*

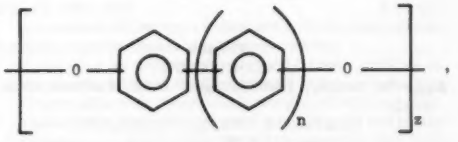
U.S. Cl. 264—210 F 7 Claims

1. A method for the manufacture of high modulus oxybenzoyl copolyester fibers which comprises: (1) making a fiber from a moldable, film forming polyester having a molecular weight in the range of from 2,000-200,000 and a melting point of at least 250°C and comprising recurring moieties of the group of Formulas I, II and III -

(I)

(II)

and



(III)

wherein n is 0 or 1; x, y and z are integers; $y:z$ = from 10:15 to 15:10, $x:y$ and $X:z$ = from 1:100 to 100:1; $x + y + z$ = from 30 to 600; and the carbonyl group of Formula I is meta and/or para to the oxy group thereof; the carbonyl groups of Formula II are meta and/or para to each other; and the oxy atoms of Formula III are meta and/or para to each other; with more than 50% of the total of said moieties having said mentioned groups thereof of para configuration; (2) thereafter heating the fiber to a temperature in the range of from about 250° to about 500°C whereby to cure the fiber and (3) stretching the fiber to increase the length thereof from about 10% to about 400% to increase the tensile strength and Young's modulus.

3,975,488

PROCESS FOR PREPARING POLY(TETRAMETHYLENE TEREPHTHALATE) YARN

Joseph H. Patterson, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 299,978, Oct. 24, 1972, Pat. No. 3,822,334, which is a continuation of Ser. No. 48,483, June 22, 1970, abandoned. This application Apr. 19, 1974, Ser. No. 462,272

The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.

Int. Cl.² D01D *5/12*

U.S. Cl. 264—210 F **4 Claims**

1. A process for preparing yarn comprised of a polymer of at least 85 percent (by weight) of poly (tetramethylene) terephthalate with a spun denier per filament of from about 0.6 to about 50, comprising the steps of sequentially:

a. preparing a polymer comprised of at least 85 percent (by weight) of poly (tetramethylene) terephthalate wherein said polymer has a relative viscosity of from about 10 to about 50;

b. extruding the filaments of said polymer through a spinnerette, wherein:

1. the spinning temperature is from about 240 to about 280° centigrade, and

2. the extruded filaments are taken up at a windup speed of from about 1000 to about 10,000 feet per minute; and

c. thereafter drawing said filaments to a draw ratio of from about 1.0 to about 5.0, said filaments being passed over a heated object comprising a pin or plate at a temperature of from about 60 to about 180 ° centigrade during said drawing step;

provided that, during said extrusion step, the spinning threadline tension per extruded filament (as measured about 70 inches from the face of the spinnerette) is at least 0.09 grams per filament, and the total spinning threadline tension (i.e., the tension on the yarn bundle) is at least $-0.4 + 0.00174$ (total spun denier of yarn) $+ 0.052$ (relative viscosity of polymer) $- 0.0366$ (spinning temperature, in degrees centigrade) $+ 0.1414$ (number of filaments extruded) $+ 0.00381$ (windup speed in feet per minute) $- 0.000000332$ (windup speed in feet per minute)^2.

3,975,489

CAST EJECTOR

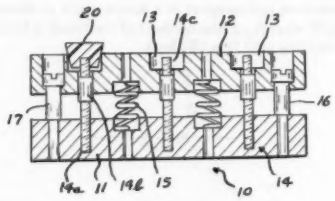
Roger W. Mercer, 1340 Arlington Drive, Fairborn, Ohio 45324

Filed Feb. 13, 1975, Ser. No. 550,109

Int. Cl.² B29C *5/00, 25/00*

U.S. Cl. 264—222 **1 Claim**

1. In a method of making and using a master cast having a plastic button embedded therein, flush with the surface thereof, said button having a threaded aperture in an exposed side thereof for facilitating removal of said master cast from an article to be molded thereabout, the improvement comprising: (a) forming a negative impresssion, of a shaped object of which reproduction is desired, in a first hardenable impression material and allowing said material to harden; (b) casting a second hardenable material against said first hardenable material and in the impression therein in a mold and allowing said second hardenable material to partially harden only thereby forming a positive casting; (c) securing a cast plastic button on a flat slab, with the side of said button having said aperture disposed against said slab; (d) depositing and manually shaping a third hardenable impression material about said button and against said slab to completely cover exposed portions of



said button; (e) inverting said mold and disposing partially hardened said second impression material against said third hardenable impression material; (f) mixing abutting portions of said second and third impression materials and manually shaping said materials to a desired configuration and allowing said materials to harden thereby forming a hardened master cast containing a threaded plastic insert; (g) removing said hardened master cast from said slab and inserting said master cast in a mold and casting a fourth hardenable material about said master cast leaving a surface of said button having said aperture exposed and allowing said fourth hardenable material to harden; and (h) threadably engaging a threaded member with threads of said aperture and using said member removing said master cast from hardened said fourth hardenable material.

3,975,490

METHOD OF MOLDING A REINFORCED TIRE FROM TWO PREFORMED SECTIONS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Division of Ser. No. 144,585, May 18, 1971. This application June 28, 1973, Ser. No. 374,552

Int. Cl.² B29H *5/02, 17/00*

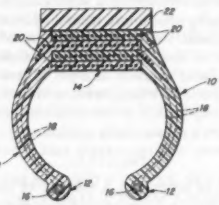
U.S. Cl. 264—250 **14 Claims**

1. The method of manufacturing a pneumatic tire body having a general toroidal shape including side walls and an annular portion on which the tread can be formed, said method comprising the steps of:

assembling elastomer impregnated reinforcing elements to form at least two separate preformed sections of a tire body, two of said sections including a reinforced side wall and plural radially-spaced reinforced annular bands adapted to be interleaved with one or more corresponding annular bands of another sections of said tire body to form the annular portion of said tire body;

shaping and hardening the elastomer of said sections while keeping said elastomer in at least a partially curable condition;

assembling shaped and hardened said sections in a mold and interleaving said annular bands of one of said section with corresponding annular bands of another of said sections; and



applying heat and pressure to the tire sections in said mold to cure said elastomer and bond the interleaved annular bands to one another to form an integral tire body having side walls joined by an annular portion including overlapped, interleaved bands and reinforcing elements.

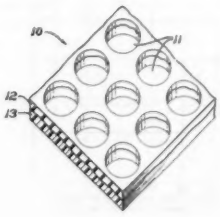
3,975,491
METHOD OF MAKING A PERFORATE ARTICLE

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 255,131, May 19, 1972, Pat. No. 3,843,476. This application July 3, 1974, Ser. No. 485,440

Int. Cl.² B29H *9/00*

U.S. Cl. 264—255 **3 Claims**



1. The method of making a perforate member comprising the steps of:

a. providing a mold cavity having a surface from which a plurality of tapered projections extend within the cavity for forming holes in the member;

b. filling the spaces between said projections in the cavity of said mold with thermoplastic material in granular form;

c. covering said granular thermoplastic material and the said projections with a layer of unvulcanized elastomeric material having a vulcanizing temperature greater than the melting point of said thermoplastic material;

d. placing a movable pressure ram over said unvulcanized elastomeric material such that said ram closely interfits the periphery of said mold cavity;

e. heating the mold and the materials therein to a temperature sufficient to vulcanize the elastomeric material and applying pressure to said ram and thus to said layer of uncured elastomeric material as the thermoplastic material melts forcing the elastomeric material to flow between the projections in the mold as a layer over the said thermoplastic material;

f. continuing the application of heat and pressure until the elastomeric material is vulcanized; and

g. cooling to integrally unite said vulcanized elastomeric material with said thermoplastic material at the interface of the materials.

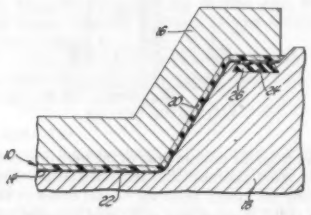
3,975,492
METHOD TO PRODUCE 3-DIMENSIONAL MATRIX SURFACE

Robert F. McLean, W. Bloomfield Township, and Peter H. Hofer, Grosse Pointe Farms, both of Mich., assignors to John Z. DeLorean Corporation, Bloomfield Hills, Mich.

Filed Aug. 21, 1975, Ser. No. 606,611

Int. Cl.² B29D *3/02, 9/06;* **B29G** *5/00*

U.S. Cl. 264—263 **5 Claims**



1. A method for molding a reinforced structure to provide a roughened bondable surface over a portion thereof, said method comprising laying up a composite material including a preformed open-cell resilient foam layer and an adjacent layer of high strength filaments, impregnating the foam layer with a thermosetting resinous material, placing said composite material between a pair of mating mold members one of said members engaging the layer of filaments, providing the mold member engaging the filament layer with an a soft and deformable elastomeric mold portion said elastomeric portion being releasable from said resinous material, closing said mold members to compress the foam layer and partly imbed adjacent filaments in the elastomeric portion, maintaining sufficient molding pressure to extrude excess resinous material from the foam layer to at least partly encapsulate the unimbedded portions of filaments, heat curing the resinous material while maintaining said molding pressure to provide a cured resin matrix, and thereafter opening the mold members to remove the rigidified structure therefrom whereby the partly imbedded filaments project above the cured resin matrix.

3,975,493
METHOD FOR FORMING HOLLOW ARTICLES FROM THERMOPLASTIC SHEETING OR FILM USING AN EXPANDABLE PLUG

Reuben A. Tigner, Bay City, and Lewis S. Mounts, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 421,005, Dec. 3, 1973, Pat. No. 3,901,640. This application Jan. 27, 1975, Ser. No. 544,466

Int. Cl.² B29C *1/12, 17/04, 17/06*

U.S. Cl. 264—292 **3 Claims**

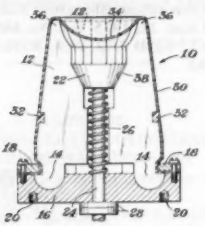
1. A method of forming a hollow article from thermoplastic synthetic resinous sheeting or film, comprising:

a. providing an expandable plug and forming mold in an apparatus adapted for forming said hollow article, said expandable plug comprising a plurality of adjacent elongated pivotal segments, means for holding one end of said segments in a juxtaposed pivotal relationship with each other, means for moving the other opposing ends of said segments outwardly away from one another as said segments advance and force said sheeting or film into said

forming mold, means for returning said segments to their original adjacent position as said segments are withdrawn from said forming mold and a flexible, resilient cover or sleeve positioned around said plurality of segments;

b. forcing said sheeting or film into said forming mold with said expandable plug in its original unexpanded position;

c. moving the forward ends of the pivotal segments of said expandable plug outwardly away from one another as said plug moves into said forming mold to draw the sheeting



or film from the bottom area of the plug into corner areas of the mold and also thin the sidewall portions thereof whereby the elastic behavior of said cover or sleeve provides radial thinning and controlled material distribution of the sheeting or film upon forming said hollow article in said mold;

d. returning said expandable plug to its original unexpanded position outside of said forming mold after said hollow article has been formed; and

e. removing said formed hollow article from said mold.

3,975,494

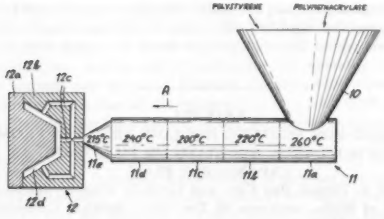
METHOD OF MAKING SYNTHETIC-RESIN TARGET PIGEON

Claude Tritenne, Les Morenes, 01710 Thoiry, France

Filed Dec. 2, 1974, Ser. No. 528,894

Int. Cl.² B29B 3/02

U.S. Cl. 264—329 **6 Claims**



1. A method of making a target pigeon comprising the steps of:

a. blending two synthetic resins which are not mutually soluble;

b. after step (a) sinusoidally heating the blend of synthetic resins to alternately raise and lower the temperature thereof as a function of time to form an aggregate therefrom; and thereafter

c. injecting said aggregate simultaneously through a plurality of filling passages into a mold under pressure to form a pigeon with a multiplicity of interfaces wherein said pigeons possess great longitudinal strength relative to their lateral strength.

3,975,495

METALS RECOVERY FROM HYDROCHLORIC ACID SOLUTIONS

Paul David Bowerman, Edmond, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 473,286, May 24, 1974. This application Feb. 2, 1976, Ser. No. 654,155

Int. Cl.² C01G 37/00, 31/00, 33/00

U.S. Cl. 423—55 **26 Claims**

1. A method of recovering a substantially vanadium-free, niobium-containing precipitate from a hydrochloric acid solution which contains vanadium, a portion of which is in an oxidation state of less than five, and niobium comprising maintaining the acid solution at a pH of less than about 2.0, heating the solution to a temperature of from about 60°C up to the boiling temperature of the solution for a period of time sufficient to form a substantially vanadium-free, niobium-containing precipitate and recovering said precipitate from the solution.

9. A method of separating a mixture of niobium, titanium and zirconium from a hydrochloric acid solution which contains the same and vanadium, a major portion of which is in an oxidation state of less than five, comprising maintaining the acid solution at a pH of less than about 2.0, heating the solution to a temperature of from about 60°C up to boiling temperature of the solution for a period of time sufficient to form a niobium, titanium and zirconium-containing precipitate substantially free of vanadium and recovering said precipitate from the solution.

17. A method which comprises maintaining a hydrochloric acid solution containing vanadium, a major portion of which is in an oxidation state of less than five, niobium, titanium, zirconium, iron, chromium and aluminum at a pH of less than about 2, heating the solution to a temperature of from about 60°C up to the boiling temperature of the solution for a period of time sufficient to form a niobium, titanium and zirconium-containing precipitate and recovering said precipitate from the solution.

3,975,496

PROCESS FOR SETTLING RED MUD IN THE DIGESTION OF BAUXITE

Graham Smalley, Huddersfield, and Eric Rothwell, Bradford, both of England, assignors to Allied Colloids Limited, Bradford, England

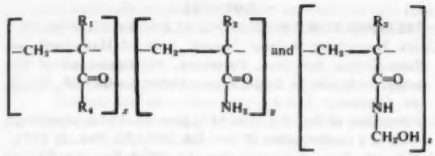
Filed Oct. 7, 1974, Ser. No. 512,579

Claims priority, application United Kingdom, Oct. 10, 1973, 47321/73

Int. Cl.² C01F 7/06, 7/14

U.S. Cl. 423—122 **3 Claims**

1. In a process for the production of alumina from bauxite comprising the steps of digesting bauxite with aqueous sodium hydroxide to give a suspension of red mud in a solution of sodium aluminate, settling said red mud and processing the resultant supernatant sodium aluminate solution to obtain alumina, the improvement comprising settling said red mud by addition to said suspension of an effective amount of a water-soluble polymer having a molecular weight greater than 0.5 times 10^6 and comprising the recurring monomer units:



in which R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen and methyl; R_4 is selected from the group consisting of OH, OM and NHR_5SO_3M where M is a cation such that the polymer is water-soluble and R_5 is $-(CH_2)_m$ where m is 1 to 6; and x, y, and z are the mole percentages of the indicated monomer units based on $x + y + z = 100$, x being 2 to 40 and $y+z$ being 60 to 98.

3,975,497

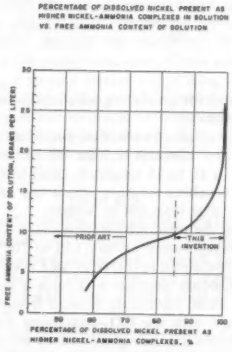
ENHANCED SELECTIVITY IN THE SEPARATION OF NICKEL AND COBALT FROM AMMONIACAL SOLUTIONS

Tadeusz K. Wiewiorowski, New Orleans, and David J. Miller, Gretna, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Continuation-in-part of Ser. No. 487,559, July 11, 1974, abandoned. This application May 19, 1975, Ser. No. 578,655

Int. Cl.² C01G *51/00, 53/12*

U.S. Cl. 423—140 **19 Claims**


PERCENTAGE OF DISSOLVED NICKEL PRESENT AS HIGHER NICKEL-AMMONIA COMPLEXES IN SOLUTION VS. FREE AMMONIA CONTENT OF SOLUTION
FREE AMMONIA CONTENT OF SOLUTION, (GRAMS PER LITER)
PRIOR ART
THIS INVENTION
PERCENTAGE OF DISSOLVED NICKEL PRESENT AS HIGHER NICKEL-AMMONIA COMPLEXES, %

1. In a method for separating cobalt from an ammoniacal solution containing dissolved therein cobalt and nickel, comprising treating said solution with a sulfiding agent which provides sulfide ions in said solution in sufficient amount to selectively precipitate the cobalt as cobalt sulfide,

the improvement which comprises treating the solution, prior to treatment with the sulfiding agent, with a material capable of providing free ammonia in solution, in an amount sufficient to increase the proportion of nickel present as higher nickel-ammonia complexes to at least about 85% of the total nickel in solution.

8. In a method for separating cobalt from an ammoniacal solution containing dissolved therein cobalt and nickel, comprising treating said solution with a sulfiding agent which provides sulfide ions in said solution in sufficient amount to selectively precipitate the cobalt as cobalt sulfide,

the improvement which comprises treating the solution, prior to treatment with the sulfiding agent, with a material capable of providing free ammonia in said solution, in an amount sufficient to provide a free ammonia content in the solution of at least about 10 grams per liter.

18. In a method for separating cobalt from an ammoniacal carbonate solution containing dissolved therein cobalt and nickel, comprising treating said solution with a sulfiding agent which provides sulfide ions in said solution in sufficient amount to selectively precipitate the cobalt as cobalt sulfide,

the improvement which comprises passing light of varying wavelength through the solution and measuring the average wavelength of maximum light absorption by the solution prior to treatment with sulfiding agent, and treating the solution, prior to sulfiding, with gaseous ammonia or a solution of aqueous ammonia until said measured average wavelength is reduced to about 585 to 605 millimicrons.

3,975,498

PROCESS FOR ADSORBING AND REMOVING NITROGEN OXIDES FROM WASTE GASES

Kazuhide Miyazaki, Tanashi, and Kiyomi Abe, Kokubunji, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,958

Claims priority, application Japan, Oct. 31, 1973, 48-123237; May 9, 1974, 49-51541

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **7 Claims**

1. A process for adsorbing and removing nitrogen oxides from waste combustion gas, utilizing electrolytic manganese dioxide blocks and regenerating the same comprising:

a. adsorbing said nitrogen oxides by passing said waste combustion gas through a column packed with electrolytic manganese dioxide blocks upwardly at a flow rate sufficient to substantially completely remove said nitrogen oxides until the adsorbing capacity of said electrolytic manganese dioxide blocks is substantially diminished;

b. eluting said column with a material selected from water or dilute aqueous alkaline solution; and

c. regenerating said electrolytic manganese dioxide blocks by drying the same at an elevated temperature.

3,975,499

SODIUM CARBONATE MONOHYDRATE CRYSTALLIZATION

John Walden, Hightstown, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 5, 1974, Ser. No. 476,560

Int. Cl.² C01D *7/24, 7/40*

U.S. Cl. 423—266 **7 Claims**

1. A process for producing sodium carbonate monohydrate crystals having a high bulk density, blocky crystal shape, and uniform particle size distribution from an aqueous solution of sodium carbonate; which comprises: adding to said aqueous solution of sodium carbonate a crystal growth additive system consisting essentially of about 20 to about 100 ppm Mg^{+2} and about 5 to about 20 ppm sodium dodecylbenzenesulfonate based on the sodium carbonate solution; crystallizing sodium carbonate monohydrate from the sodium carbonate solution; and recovering the sodium carbonate monohydrate crystals.

3,975,500

PROCESS FOR PRODUCING HIGH ACTIVE OXYGEN, LOW BULK DENSITY SODIUM PERBORATE

Donald Edwin Cash, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1974, Ser. No. 501,789

Int. Cl.² C01B *15/12*

U.S. Cl. 423—281 **3 Claims**

1. A process of producing sodium perborate tetraydrate having an active oxygen content of about 11.0 to 12.0 weight percent and a bulk density of about 0.40 to 0.70 g./cc., said process comprising the steps of (1) agglomerating preformed sodium perborate tetrahydrate having an active oxygen content of about 10 to 10.5% by weight and a bulk density of

about 0.80 to 0.95 g./cc. with hydrogen peroxide as a wetting agent and binder to form spherical particles and (2) drying the resulting agglomerated sodium perborate particles at a temperature below 45°C. to remove all free water, the amount of hydrogen peroxide used in step (1) being about 0.1 to 15 weight percent based upon the weight of the starting sodium perborate.

3. Sodium perborate tetrahydrate made by the process of claim 1, said sodium perborate having spherical particles, an active oxygen content of from about 11.0 to about 12.0 weight percent and a bulk density of from about 0.40 to 0.70 g./cc and free from organic binder.

3,975,501

FORMATION OF A FLUORINE COMPOUND AND THE COMPOUND

Joseph Gordon, Morris Township, Morris County, and Bernard Sukornick, Elizabeth, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 26, 1963, Ser. No. 276,106
Int. Cl.² C01B *21/00*
U.S. Cl. 423—351 8 Claims

1. The process for making dichlorofluoramine which comprises introducing into a reaction zone an alkali metal azide, subjecting said azide in said zone to the action of chlorine monofluoride while maintaining in said zone temperatures above the boiling point of dichlorofluoramine but not substantially above 150° C., and discharging from said zone reaction products containing dichlorofluoramine.

3,975,502

PROCESS FOR RECOVERY OF HYDROGEN CYANIDE

Eddie G. Mahler, Beaumont; Patrick R. McAllister, and Eugene D. Wilhoit, both of Victoria, all of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 287,038, Sept. 7, 1972, abandoned. This application July 13, 1973, Ser. No. 378,969
Int. Cl.² C01C *3/04*
U.S. Cl. 423—372 7 Claims

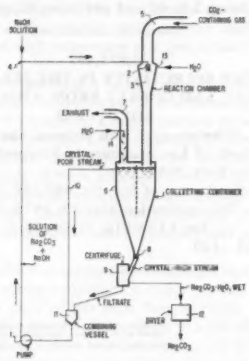
1. A process for recovery of hydrogen cyanide contained in a gaseous mixture which comprises (a) treating the gaseous mixture with an aqueous solution of analkali metal carbonate, at a pH of at least 9.0 and at a temperature in the range of about 15°C. to about 150°C. and under a pressure in the range 0.5 to 5.0 atmospheres to absorb hydrogen cyanide and to produce an aqueous product solution containing alkali metal cyanide and alkali metal bicarbonate while expelling nonabsorbed gases from the product solution; (b) contacting the aqueous product solution from (a) with a ketone containing from three to fifteen carbon atoms at a temperature in the range of 25°–100°C. under a pressure in the range 0.5 to 5.0 atmospheres to produce a cyanohydrin-ketone mixture and to regenerate in aqueous solution the alkali metal carbonate, the concentration of alkali metal carbonate in the aqueous solution in step (a) being about 10–45% by weight such that the cyanohydrin-ketone mixture produced in step (b) is substantially immiscible with the aqueous solution containing the regenerated alkali metal carbonate; (c) separating the aqueous alkali metal carbonate solution from the cyanohydrin-ketone mixture; (d) recycling the carbonate solution to the gas absorption step (a); recovering the cyanohydrin-ketone mixture (e) and subjecting said cyanohydrin - ketone mixture to a temperature in the range of 50 – 160°C and under a pressure of 0.1 to 5 atmospheres to regenerate the corresponding ketone and hydrogen cyanide from the cyanohydrin and recovering the hydrogen cyanide and ketone.

3,975,503

METHOD FOR PRODUCING ALKALI CARBONATE

Ulrich Hauschild; Reimar Musall, both of Hannover, and Hans-Jürgen Schröder, Pattensen, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 436,719, Jan. 25, 1974, abandoned, which is a continuation of Ser. No. 204,058, Dec. 2, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,365
Claims priority, application Germany, Dec. 8, 1970, 2060287; Aug. 27, 1971, 2143008
Int. Cl.² C01D *7/07*
U.S. Cl. 423—421 14 Claims



1. A method for producing alkali carbonate crystals, comprising the steps of:

a. adding to an alkali carbonate and alkali hydroxide recycle stream that contains at least 8% by weight of alkali hydroxide, a 10 to 75 weight-% alkali hydroxide solution to form a resulting solution which has an alkali hydroxide content of at least 8% by weight;

b. spraying the resulting solution into a CO_2-containing gas whose temperature is from 150 to 700°C to react a portion of the alkali hyroxide in said resulting solution with the CO_2-containing gas and form a liquid mixture containing alkali carbonate formed from reaction of alkali hydroxide with the CO_2-containing gas, the amount of alkali hydroxide being reacted to form alkali carbonate being equal to the amount of alkali hydroxide added to the recycle stream during the step of adding;

c. collecting said liquid mixture containing said formed alkali carbonate from the gas at the end of a residence time of said mixture in said gas of from 0.1 to 10 seconds;

d. separating alkali carbonate crystals from the collected liquid mixture, and;

e. recycling the collected liquid mixture, following the step of separating, as the said alkali carbonate and alkali hydroxide recycle stream to the step of adding.

3,975,504

PRODUCTION OF CARBON BLACK FROM COAL

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 393,492, Aug. 31, 1973, abandoned. This application June 2, 1975, Ser. No. 583,317
Int. Cl.² C09C *1/50*
U.S. Cl. 423—449 5 Claims

1. A method of producing carbon black from coal comprising

a. introducing pulverized coal suspended in a suspending stream of oxidant gas tangentially through the periphery

of a vertically positioned reactor to establish said coal as a helically flowing mass proximate the wall of said reactor;

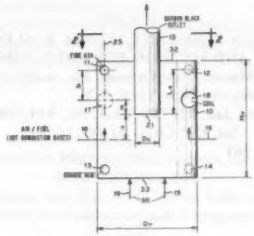
b. introducing

aa. hot combustion gases formed by the combustion of fuel gas and an oxidant gas; as well as

bb. primary oxidant gas upwardly into said reactor toward the locus of introduction of said coal;

c. forming a mixture comprising said coal and said hot combustion gases;

d. reacting said mixture to produce carbon black and ash from said coal;



e. passing said carbon black inwardly toward the vertical axis of the reactor;

f. introducing secondary oxidant gas upwardly along the vertical axis of said reactor into contact with said carbon black to increase the photelometer of said carbon black;

g. withdrawing a first stream comprising ash formed in step (d) tangentially through the periphery of said reactor proximate to the upper terminus of said reactor;

h. withdrawing a second stream comprising ash formed in step (d) tangentially through the periphery of said reactor proximate the lower terminus of said reactor;

i. withdrawing carbon black overhead from said reactor along the vertical axis of said reactor.

3,975,505

PRODUCTION OF CHLORINE DIOXIDE

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,666

Int. Cl.[2] C01B *11/02, 7/02;* **C01D** *5/02*

U.S. Cl. 423—478 **9 Claims**

1. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and a neutral alkali metal salt wherein

a. an alkali metal chlorate, an alkali metal chloride and a strong mineral acid selected from the group consisting of sulfuric acid and mixtures of sulfuric acid and a member of the group consisting of hydrochloric acid and phosphoric acid are continuously reacted in a single vessel generator-evaporator-crystallizer in proportions to generate chlorine dioxide and chlorine;

b. the temperature is maintained at between about 65° to about 85°C;

c. the acidity of the reaction solution is maintained within the range of from 2 to 4 normal;

d. the reaction solution is subjected to a vacuum of from about 100 to about 400 millimeters of mercury absolute to effect evaporation of water vapor;

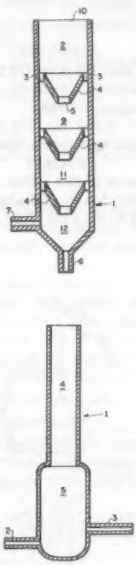
e. chlorine dioxide and chlorine produced by said reaction solution is withdrawn in admixture with said water vapor, and the reaction is conducted in the presence of at least one catalyst selected from the group consisting of vanadium pentoxide, silver ions, manganese ions, dichromate ions and arsenic ions; and

f. neutral alkali metal salt of said mineral acid is crystallized within said generator-evaporator-crystallizer and withdrawn therefrom in the form of an aqueous slurry containing minor amounts of chlorate, chloride and acid values;

the improvement which comprises:

continuously passing the slurry containing neutral alkali metal salt crystals produced in said generator-evaporator-crystallizer into the top of a separatory column, in a downward flow;

countercurrently passing a stream of hot water continuously upwardly through said column at a rate sufficient to effect washing of the downwardly flowing crystals whereby chlorate, chloride and acid values recovered therefrom are continuously and substantially completely returned to said generator-evaporator-crystallizer; and



continuously removing an aqueous slurry of substantially pure neutral alkali metal sulfate salt crystals from the bottom of said separatory column.

2. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and alkali metal salt wherein

a. an alkali metal chlorate, an alkali metal chloride and a strong mineral acid selected from the group consisting of sulfuric acid and mixtures of sulfuric acid and a member of the group consisting of hydrochloric acid and phosphoric acid are continuously reacted in a single vessel generator-evaporator-crystallizer in proportions to generate chlorine dioxide and chlorine, and in the absence of a catalyst;

b. the temperature is maintained at between about 65° and about 85°C;

c. the acidity of the reaction solution is maintained within the range of from above 4 to about 11;

d. the reaction solution is subjected to a vacuum of from about 100 to about 400 millimeters of mercury absolute to effect evaporation of water vapor;

e. chlorine dioxide and chlorine produced by said reaction solution is withdrawn in admixture with said water vapor; and

f. alkali metal salt of said mineral acid is crystallized within said generator-evaporator-crystalizer and continuously withdrawn therefrom in the form of an aqueous slurry containing minor amounts of chlorate, chloride and acid

values;

the improvement which comprises continuously passing the slurry containing alkali metal salt crystals produced in said generator-evaporator-crystallizer into the top of a separatory column, in a downward flow;

countercurrently passing a stream of hot water continuously upwardly through said column at a rate sufficient to effect washing of the downwardly flowing crystals, whereby chlorate, chloride and acid values recovered therefrom are continuously and substantially completely returned to said generator-evaporator-separator, and acid alkali metal salt crystals are converted to neutral alkali metal salt crystals; and

continuously removing an aqueous slurry of substantially pure neutral alkali metal sulfate salt crystals from the bottom of said separatory column.

3,975,506

PRODUCTION OF CHLORINE DIOXIDE

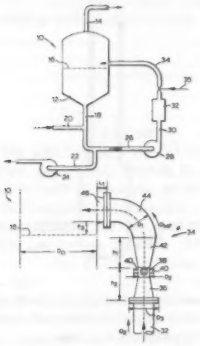
Gerald Cowley, Mississauga, Canada, assignor to Erco Industries Limited, Islington, Canada

Continuation-in-part of Ser. No. 376,380, July 5, 1973, Pat. No. 3,895,100. This application May 12, 1975, Ser. No. 576,439

The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.² C01B *11/02*, *7/04*; C01D *3/04*

U.S. Cl. 423—478 **4 Claims**



1. A continuous method for the production of chlorine dioxide which comprises continuously maintaining a chlorine dioxide producing reaction medium in a reaction zone, the reaction medium containing sodium chlorate and hydrochloric acid and having an acidity of about 0.05 to about 1 normal, continuously generating chlorine dioxide and chlorine from said reaction medium and continuously evaporating water from said reaction medium at substantially the boiling point thereof while the reaction medium is maintained under a subatmospheric pressure, continuously removing from said reaction zone a gaseous mixture consisting of said generated chlorine dioxide and chlorine and said evaporated water, continuously recovering chlorine dioxide from said gaseous mixture, continuously depositing sodium chloride in said reaction zone, continuously removing from said reaction zone a slurry containing sodium chloride and part of said reaction medium continuously forming a recycle mixture having a decreased sodium chloride content and containing make-up quantities of sodium chlorate, heating said recycle mixture substantially to an elevated temperature which is the boiling point of said reaction mixture at the prevailing absolute pressure in said reaction zone, accelerating the heated mixture to establish a back pressure exceeding the difference in saturation vapour pressure of the heated mixture and of said reaction medium, adding hydrochloric acid to said accelerated heated mixture substantially at the maximum velocity of said mixture resulting from said acceleration in sufficient quantity to provide a feed material for said reaction zone which provides an acidity of about 0.05 to about 1 normal in said reaction medium, allowing gaseous material in said feed material to expand while maintaining a low rate of acceleration, feeding said expanded feed mixture to said reaction zone at a level above the liquid level in said reaction zone, and maintaining the level of liquid in said reaction zone substantially constant.

3,975,507

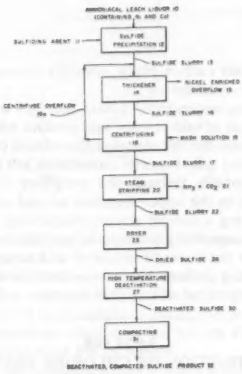
OXIDATION-RESISTANT NICKEL AND COBALT SULFIDES AND METHOD FOR PREPARING SAME

Rapheal Fritz Matson, New Orleans, La., assignor to Freeport Minerals Company, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,498

Int. Cl.² C01G *51/00*, *53/00*

U.S. Cl. 423—561 **27 Claims**



1. A method for inhibiting the rate of oxidation of a sulfide selected from the group consisting of nickel sulfide, cobalt sulfide, and mixtures thereof, prepared by sulfiding an ammoniacal solution containing dissolved therein nickel, cobalt or a mixture thereof, which comprises

heating the sulfide to a temperature of about 100°F. or greater to remove unbound water,

heating the sulfide to a temperature of about 280°F. or greater to remove bound water,

heating the sulfide to a temperature of at least about 1000°F. in the presence of a substantially inert atmosphere, and

cooling the heated sulfide to a temperature less than about 500°F, in the presence of a substantially inert atmosphere.

3,975,508

METHOD OF PREVENTION AND REMOVAL OF SULFUR DEPOSITS FROM H_2S ABSORPTION EQUIPMENT

Frank Peter Richardson, Lenexa, and David Anthony Young, Leawood, both of Kans., assignors to J. F. Pritchard and Company, Kansas City, Mo.

Filed Feb. 11, 1975, Ser. No. 548,980

Int. Cl.² C01B *17/04*

U.S. Cl. 423—571 **8 Claims**

1. In a Stretford-type process for removing H_2S from a sour gas stream wherein the gas is brought into contact with a

circulating liquid alkali absorption stream containing a quinone in a contact zone, and in successive order the H_2S is absorbed, converted to an alkali hydrosulfide, oxidized with a regenerative oxidizing agent to form elemental sulfur with consequent reduction of the oxidizing agent, with the reduced oxidizing agent being reoxidized by said quinone, there being an attendant tendency for such elemental sulfur to collect in the zone and impede liquid and gas flow therethrough, the improvement which comprises the steps of:

adding ammonia to at least one of said streams in amounts sufficient to control the collection of sulfur in said zone and ranging from about 10 ppm to that concentration of ammonia which may deleteriously affect the absorption capability of said alkali stream; and

maintaining the ammonia added at a level to control said sulfur collection by the solubilization and subsequent removal thereof from said zone with said circulating liquid.

3,975,509
PROCESS FOR PRODUCING ALPHA ALUMINA MONOHYDRATE

Dennis Jack Royer, and George G. Hritz, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 298,116, Oct. 16, 1972, abandoned. This application Apr. 3, 1975, Ser. No. 564,946

Int. Cl.² C01F *7/02*

U.S. Cl. 423—626 **3 Claims**

1. A method for producing alpha alumina monohydrate product having:

a. a loose bulk density from about 40 to about 60 lb/ft³,

b. a surface area from about 100 to about 250 m²/g,

c. a cumulative pore volume, 0–10,000 A from about 0.3 to about 0.6 cc/g, and

d. from about 75 to about 100 percent of said cumulative pore volume in pores from about 30 to about 120 A in diameter;

by mixing 100 parts dispersible alpha alumina monohydrate with from about 30 to about 3000 parts water and from about 0.3 to about 40 parts acid, said acid being selected from the group consisting of hdyrochloric acid, nitric acid, acetic acid and monochloroacetic acid to form a mixture of uniform consistency and thereafter drying to produce alpha alumina monohydrate product having said properties.

3,975,510
LOW-DENSITY, HIGH-POROSITY ALUMINA EXTRUDATES AND A METHOD FOR PRODUCING SAID EXTRUDATES

Bruce E. Leach, Ponca City, Okla.; George G. Hritz, Charlotte, N.C., and Dennis Jack Royer, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. Nos. 268,246, July 3, 1972, abandoned, Ser. No. 168,420, Aug. 2, 1971, abandoned, and Ser. No. 191,091, Oct. 20, 1971, abandoned. This application Apr. 14, 1975, Ser. No. 567,564

Int. Cl.² C01F *7/02*

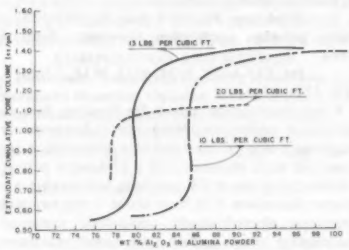
U.S. Cl. 423—628 **3 Claims**

1. A method for preparing alumina extrudates having a loose bulk density from about 15 to about 35 lb/ft³, a cumulative pore volume, 0–10,000 A, from about 0.8 to about 2.0 cc/g, and a surface area of about 150 to about 350 m²/g consisting essentially of sequentially admixing 50 parts alumina having the properties: a loose bulk density from about 7.5 to about 25 lb/ft³, a cumulative pore volume, 0–10,000 A, from about 1.0 to about 2.75 cc/g, a surface area from about 260 to about 400 m²/g, and an Al_2O_3 content from about 77 to about 100 weight percent Al_2O_3 with from about 40 to about 125 parts water to form an extrudable putty-like alumina-water mixture and extruding said mixture wherein said alumina is produced by:

a. hydrolyzing aluminum alkoxides to produce an aqueous alumina portion containing up to about 32 weight percent Al_2O_3 and an organic portion;

b. separating said aqueous alumina portion from said organic portion;

c. admixing said aqueous alumina portion with an organic solvent selected from the group consisting of ethanol, n-propanol, isopropanol, n-butanol, isobutanol, tertiary butanol, and mixtures thereof to form a solvent-aqueous


13 LBS. PER CUBIC FT.
20 LBS. PER CUBIC FT.
10 LBS. PER CUBIC FT.
EXTRUDATE CUMULATIVE PORE VOLUME (cc/gm)
WT % Al_2O_3 IN ALUMINA POWDER

alumina mixture containing an amount of said solvent equal to at least 25 percent of the amount of said solvent required to azeotropically remove the water from said mixture;

d. drying said solvent-aqueous alumina mixture to produce alumina having a loose bulk density from about 7.5 to about 25 lb/ft³, a cumulative pore volume, 0–10,000 A, from about 1.0 to about 2.75 cc/g, a surface area from about 260 to about 400 m²/g, and an Al_2O_3 content from about 77 to about 100 weight percent Al_2O_3.

3,975,511
SOLID PHASE RADIOIMMUNOASSAY

William P. Vann, Beaver Dams, and Sidney Yaverbaum, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,252

Int. Cl.² G01N *33/00;* **G01T** *1/16;* **G21H** *5/02*

U.S. Cl. 424—1.5 **9 Claims**

1. A method for determining the concentration of digoxin in a solution which comprises the steps of:

a. incubating the solution with a known amount of radioactively labelled digoxin and a suspendable composite consisting of anti-digoxin antiserum coupled chemically through an intermediate silane coupling agent to a high surface area essentially water-insoluble inorganic carrier having an average particle size between about 0.05 and 12 microns, the incubation being for a period sufficient to form immunochemical complexes;

b. centrifuging the complexes from the solution;

c. counting the radioactivity of either the centrifuged complexes or the remaining solution; and

d. relating the count of step (c) to a standard to determine the concentration of digoxin.

3,975,512
NON-TOXIC BROMINATED PERFLUOROCARBONS RADIOPAQUE AGENTS

David M. Long, Jr., Villa Park, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Continuation of Ser. No. 100,408, Dec. 21, 1970, abandoned. This application Aug. 26, 1974, Ser. No. 500,463

Int. Cl.² A61K *29/02*

U.S. Cl. 424—5 **13 Claims**

1. In a process for radiologically examining a part of the body of an animal, the improvement comprising contacting said body part with an effective amount of a radiopaque agent

comprising a non-toxic monobrominated acyclic perfluorocarbon.

3,975,513

SUSTAINED-RELEASE TABLET FOR PROPHYLAXIS AGAINST TRACE ELEMENT DEFICIENCY DISEASES

Horstmar Hecht, Castrop-Rauxel; Wolfgang Laue, Waltrop, and Manfred Kirchgebner, Freising-Weihenstephan, all of Germany, assignors to Gewerkschaft Victor Chemische Fabrik, Castrop-Rauxel, Germany

Filed Aug. 30, 1974, Ser. No. 502,123

Claims priority, application Germany, Sept. 6, 1973, 2344884

Int. Cl.² A61K *9/24, 9/32, 9/58, 33/26*

U.S. Cl. 424—19 **7 Claims**

1. A sustained-action tablet for treating iron deficiency comprising a tablet containing iron-II-fumarate or iron-II-diphosphate + iron powder and of a composition such that it releases said trace element over a prolonged period of time, said tablet being about 18 mm long and having a minimum transverse dimension of at least about 3 mm and including an acid-resistant physiologically compatible sustained release plastic coating which ensures the tablet maintains its size during the sustained release, whereby said tablet is not eliminated prematurely through the pylorus of a suckling piglet yet is eliminated when the piglet pylorus opening has increased in size due to the growth of the pig.

3,975,514

FLUORIDE MOUTH WASH COMPOSITIONS

Geraldine Fay Weisz, 2240 Harmain Road, Pittsburgh, Pa. 15235

Filed Jan. 13, 1975, Ser. No. 540,400

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **9 Claims**

1. A mouth wash adapted to prevent dental caries of the teeth, consisting essentially of an aqueous solution of a water-soluble fluoride as active agent, sodium chloride and an anionic surface active wetting agent of a character having no substantial effect in inactivating the fluoride, said sodium chloride being present in a small but effect amount to increase the effectiveness of the fluoride to prevent incipience of dental caries and said wetting agent being present in minor proportion relative to the amount of said fluoride present, said fluoride being present in a concentration of approximately one grain per ounce of the solution.

3,975,515

REDUCING THE ALKALI CONCENTRATION IN HAIR TREATING COMPOSITIONS

Theodor Wajaroff, and Eugen Konrad, both of Darmstadt, Germany, assignors to Wella AG, Darmstadt, Germany

Filed Sept. 30, 1974, Ser. No. 510,846

Claims priority, application Germany, Sept. 29, 1973, 2349050

Int. Cl.² A61K *7/09*

U.S. Cl. 424—72 **6 Claims**

1. In a method for the treatment of live hair which comprises applying thereto a conventional alkaline composition that is adapted for permanently waving, shaping, or straightening live hair, the improvement which comprises adding to the said composition before it is applied to live hair an agent which gradually reduces the alkalinity of the said composition, the said agent being selected from the group consisting of 2-chloroethanol, 1-chloro-2-propanol, chlorobutanol, ethyl acetate, ethyl propionate 2-methoxyethyl acetate, methyl chloroacetate, ethyl chloroacetate, ethyl lactate, ethyl pyruvate, diethyl malonate, 1,3-dioxolan-2-one, triethyl citrate, ethylene glycol monostearate, monoacetin, diacetin, triacetin, gammabutyrolactone, chloroacetamide, chloroacetylurea, cyanuric chloride, and glycol sulfite.

3,975,516

METHODS OF TREATING CELLULAR TISSUE

William P. Hettinger, Jr., 37 St. Andrews Road, Severna Park, Md. 21146

Continuation-in-part of Ser. No. 881,616, Dec. 2, 1969, abandoned. This application June 5, 1972, Ser. No. 259,556

Int. Cl.² A61K *31/78*

U.S. Cl. 424—81 **1 Claim**

1. A process for encasement and infiltration of animal cellular tissue to reduce the influx of oxygen nutrients, amino acids and liquids thereto, to reduce the efflux of liquids therefrom and to retain in situ and retard efflux of liquids and therapeutic agents and to block capillary and extra cellular plasma flow, comprising the steps of introducing into said animal tissue an effective amount of a polyacrylamide gel substantially insoluble in said animal tissue and body fluids associated therewith.

3,975,517

ENTERIC DISEASE VACCINE

Michael R. Wilson, Guelph, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Division of Ser. No. 256,977, May 25, 1972, Pat. No. 3,907,987. This application Mar. 19, 1975, Ser. No. 559,762

Int. Cl.² A61K *39/40;* **A23C** *9/00, 21/00*

U.S. Cl. 424—87 **5 Claims**

1. A method of protecting or treating newborn swine subject to *E. coli* infections comprising:

a. recovering milk from milk cows vaccinated intramammarily into the test cistern while pregnant with the bacterial vaccine comprising a live strain or strains of selected *E. coli* pathogenic to swine incubated in and modified by dilute solutions of about 0.02 to about 0.08% v/v formalin to give an altered growth pattern and appearance and reduced viable cell count; and

b. continually feeding the piglets with said milk or protective, antibody-containing fraction thereof having antibody titers effective against said infections, for the period of protection or treatment required.

3,975,518

LIQUID WATER-SOLUBLE INSECTICIDAL CONCENTRATES OF S-METHYL N-[(METHYLCARBAMOYL)-OXY]THIOACETIMIDATE

Archibald Miller Hyson, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 359,503, May 11, 1973, abandoned. This application Apr. 10, 1974, Ser. No. 459,579

Int. Cl.² A01N *9/12, 9/20*

U.S. Cl. 424—173 **7 Claims**

1. An insecticidal composition which is substantially homogeneous, has low-temperature stability and a high flash point which comprises an insecticidally effective amount of S-methyl N-[(methylcarbamoyl)oxy]thioacetimidate in a solvent system consisting essentially of 20–92% cyclohexanone, 3–25% lower alkanol and at least 5% water, wherein 0–65% by weight of said cyclohexanone is replaced by an equal quantity of cyclohexanol, such that when sufficient thioacetimidate to create 15–35% solution of said thioacetimidate is dissolved therein at 25°C, a single phase results.

3,975,519

METHOD FOR INCREASING THE OXYGEN PARTIAL PRESSURE IN THE BLOODSTREAM OF MAMMALS

John L. Gainer, Charlottesville, Va., assignor to University of Virginia, Charlottesville, Va.

Filed June 9, 1975, Ser. No. 584,946

Int. Cl.² A61K *31/70, 31/20, 31/195, 31/13*

U.S. Cl. 424—180 **5 Claims**

1. A method for raising the oxygen partial pressure in the bloodstream which comprises administering to a mammal in

need of such treatment an effective dose of a water-soluble carotenoid, whereby the oxygen partial pressure is increased.

3,975,520

BIOLOGICALLY ACTIVE MATERIAL

Ernst Boris Chain, London; Kenneth William Buck, Crawley Down; Joan Elizabeth Darbyshire, London; Geoffrey Talbot Banks, Billingshurst; Fred Himmelweit, and Giulio Ratti, both of London, all of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 282,365, Aug. 21, 1972, abandoned, which is a continuation of Ser. No. 124,496, March 15, 1971, abandoned. This application July 10, 1974, Ser. No. 487,279

Claims priority, application United Kingdom, Mar. 23, 1970, 13826/70

Int. Cl.² A61K *31/71*; **C12B** *1/00, 7/00*

U.S. Cl. 424—181 **8 Claims**

1. Substantially pure virus particles capable of stimulating the production of interferon in animals upon parenteral administration, said virus particles being obtained by

a. cultivating the mold *Aspergillus foetidus* or *Aspergillus niger* in or on a nutrient medium;

b. separating the mycelium of the mold *Aspergillus foetidus* or *Aspergillus niger* from the culture medium in which or on which it has been grown; and

c. treating the culture medium with a ribonucleic acid or a non-toxic salt thereof, adjusting the pH of the resulting liquor to a pH between 3 and 6, separating the resultant precipitate from the supernatant, and concentrating and purifying a neutralized suspension of the precipitate to yield the desired virus particles; or

d. disrupting the mycelium of the mold *Aspergillus foetidus* or *Aspergillus niger* to release the cell contents, removing the cell debris from a suspension of the disrupted mycelium, treating the remaining liquor with a ribonucleic acid or a non-toxic salt thereof, adjusting the pH of the resulting liquor to a pH between 3 and 6, separating the resulting precipitate from the supernatant, and concentrating and purifying a neutralized suspension of the precipitate to yield the desired virus particles.

3,975,521

PROSTATE CARCINOMA TREATMENT

Donald R. Bennett, Midland, Mich., and James A. McHard, Gainesville, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 837,922, June 30, 1969, Pat. No. 3,830,912, which is a continuation-in-part of Ser. No. 741,336, July 1, 1968, abandoned. This application May 1, 1974, Ser. No. 465,780

Int. Cl.² A61K *31/695*

U.S. Cl. 424—184 **5 Claims**

1. A method of producing palliative action in the treatment of prostate carcinoma comprising administering to a patient suffering from said disease an amount effective to provide palliative relief of 2,6-cis-diphenylhexamethylcyclotetrasiloxane.

3,975,522

CONTROL OF INSECTS AND ACARIDS WITH N-PHOSPHINYLAMIDINES

Jörg Bader, deceased, late of Arlesheim, Switzerland, by Dagmar Bader-Ludwig, legal representative, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

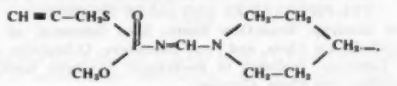
Division of Ser. No. 315,273, Dec. 14, 1972. This application July 23, 1975, Ser. No. 598,449

Claims priority, application Switzerland, Dec. 17, 1971, 18553/71; Feb. 19, 1972, 1869/72

Int. Cl.² A01N *9/36*

U.S. Cl. 424—200 **5 Claims**

5. A method for combatting insects or acarids which comprises applying thereto an-insecticidally or acaricidally effective amount of a compound of the formula



3,975,523

O-(2-CARBISOPROPOXYPHENYL)-THIONO-PHOSPHORIC (PHOSPHONIC) ACID ESTER-AMIDES AND ESTER-IMIDES AND INSECTICIDAL AND ACARICIDAL COMPOSITION AND METHOD

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

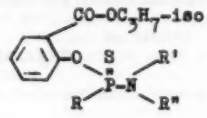
Filed July 30, 1974, Ser. No. 493,201

Claims priority, application Germany, Aug. 8, 1973, 2340080

Int. Cl.² A01N *9/36*; **C07F** *9/24, 9/44*

U.S. Cl. 424—212 **9 Claims**

1. An O-(2-carbisopropoxyphenyl)-thionophosphoric(-phosphonic) acid ester amide or ester imide of the formula



in which

R is lower alkyl or alkoxy,

R′ is hydrogen, and

R″ is a formyl or acetyl radical, or

R′ and R″ conjointly form lower alkoxymethylene radical.

3,975,524

3-PIPERAZINO-ISOQUINOLINES AND SALTS THEREOF

Josef Nickl; Erich Müller; Wolfgang Schröter; Walter Haarmann, and Josef Roch, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

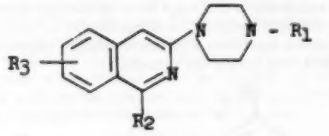
Filed Apr. 11, 1975, Ser. No. 567,234

Claims priority, application Germany, Apr. 25, 1974, 2420012; Jan. 31, 1975, 2503961

Int. Cl.² A61K *31/54*; **C07D** *279/12*

U.S. Cl. 424—246 **8 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 3 carbon atoms, alkanoyl of 1 to 3 carbon atoms, or alkoxycarbonyl of 2 to 4 carbon atoms,

R_2 is morpholino, thiomorpholino or 1-oxido-thiomorpholino, and

R_3 is hydrogen, fluorine, chlorine, bromine, methyl, methoxy or nitro,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,975,525
N-[4'-IMIDAZOLIDINON-(2)-YL-PHENETHYL]-N'-PYRIDYL-PIPERAZINES AND SALTS THEREOF

Anton Mentrup; Ernst-Otto Renth; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

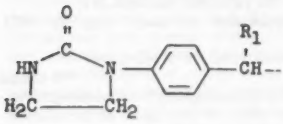
Continuation-in-part of Ser. No. 440,823, Feb. 8, 1974, Pat. No. 3,937,708, which is a continuation of Ser. No. 259,532, June 5, 1972, abandoned. This application Dec. 1, 1975, Ser. No. 636,740

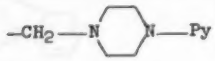
Claims priority, application Austria, June 7, 1971, 4920123/71

Int. Cl.² C07D *401/14*; A61K *31/495*

U.S. Cl. 424—250 **5 Claims**

1. A compound of the formula





wherein R_1 is hydrogen or hydroxyl, and Py is pyridyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,975,526
SYMPATHICOMIMETIC REMEDY INDUCING VASOPRESSOR EFFECTS AFTER ORAL AND PARENTERAL ADMINISTRATION

Franz Reicheneder, Ludwigshafen; Rudolf Kropp, Limburgerhof; August Amann, Ludwigshafen; Hubert Giertz, Limburgerhof, and Joerg Schuster, Viernheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

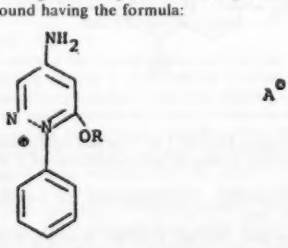
Continuation of Ser. No. 276,935, Aug. 1, 1972, abandoned. This application June 10, 1974, Ser. No. 478,107

Claims priority, application Germany, Aug. 7, 1971, 2139687

Int. Cl.² A61K *31/495*

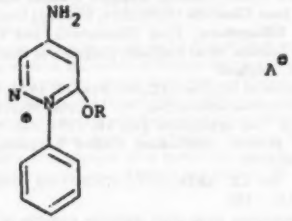
U.S. Cl. 424—250 **12 Claims**

1. A composition in dosage form for cardiac stimulation or for increasing blood pressure comprising (1) a carrier and (2) as the active ingredient a pharmaceutically effective amount of a compound having the formula:



wherein R is alkyl of from 1 to 4 carbon atoms and A^- is a pharmaceutically acceptable anion, the amount of said active ingredient in each dose being from about 1 to 70 mg.

7. A method for cardiac stimulation or to increase the blood pressure in an animal which comprises: administering to said animal in need thereof in dosage form an effective cardiac stimulating or blood pressure increasing amount of a composition comprising (1) a carrier and (2) as the active ingredient a compound having the formula:



wherein R is alkyl of from 1 to 4 carbon atoms and A^- is a pharmaceutically acceptable anion.

3,975,527
AGRICULTURAL PLANT PROTECTION COMPOSITIONS CONTAINING ISOMERS OF TRIFORINE METHOD OF USE

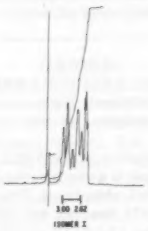
Walter Ost, Bingen; Klaus Thomas, Gau-Algesheim; Ekkehard Amadori, Darmstadt-Arheilgen, and Rolf Darskus, Gau-Algesheim, all of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Division of Ser. No. 441,010, Feb. 11, 1974, Pat. No. 3,912,738. This application July 29, 1975, Ser. No. 600,065

Claims priority, application Germany, Feb. 10, 1973, 2306623; Oct. 15, 1973, 2351707; Dec. 21, 1973, 2363729

Int. Cl.² A01N *9/22*

U.S. Cl. 424—250 **4 Claims**



1. An agricultural plant protection composition consisting essentially of an inert carrier and an effective fungicidal amount of racemic triforine or a mixture thereof with meso-triforine, said mixture consisting of at least 60% by weight of racemic triforine and the balance meso-triforine.

3,975,528
INSECTICIDAL 2-IMINO-1,3-DITHIETANE DERIVATIVES

Roger Williams Addor; James Byron Lovell, both of Pennington, and Sidney Kantor, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 493,944, Aug. 14, 1974, Pat. No. 3,928,382, which is a division of Ser. No. 235,397, March 16, 1972, abandoned. This application Sept. 25, 1975, Ser. No. 616,793

Int. Cl.² A01N *9/12*; C07D *213/74*

U.S. Cl. 424—263 **8 Claims**

1. A 2-imino-1,3-dithietane having the formula:

wherein R_4 is a member selected from the group consisting of pyridyl, mono or diloweralkyl substituted pyridyl, nitro substituted pyridyl, mono halo substituted pyridyl and dihalo substituted pyridyl.

8. A method for controlling insects and acarina comprising applying to the larvae, larval habitat or dietary media of said larvae, a larvicidally effective amount of a compound according to claim 1.

3,975,529

DIEBENZO(B,E)THIEPINES

Pierre Henri Deribie, Le Perreux; Vesperto Torelli, Maisons-Alfort, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel-UCLAF, Paris, France

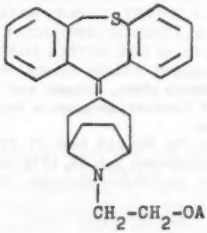
Filed June 24, 1975, Ser. No. 589,885

Claims priority, application France, July 4, 1974, 74.23280

Int. Cl.² A01N *9/22;* **C07D** *471/08*

U.S. Cl. 424—265 **11 Claims**

1. A compound selected from the group consisting of 6,11-dihydrodibenzo(b,e)thiepines of the formula



wherein A is selected from the group consisting of hydrogen and acyl of an alkanoic acid of 2 to 19 carbon atoms in the form of their optically active isomers or racemic mixtures thereof and their non-toxic, pharmaceutically acceptable acid addition salts.

3,975,530

N-CYANO-N'-HETEROCYCLIC-ALKYL QUANIDINE INHIBITORS OF H_2 HISTAMINE RECEPTORS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

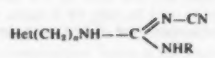
Division of Ser. No. 385,027, Aug. 2, 1973, Pat. No. 3,897,444. This application Apr. 18, 1975, Ser. No. 569,717

Claims priority, application United Kingdom, Sept. 5, 1972, 41160/72; Feb. 8, 1973, 6154/73

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 **11 Claims**

1. A pharmaceutical composition to inhibit H-2 histamine receptors comprising a pharmaceutical carrier and in an effective amount to inhibit H-2 histamine receptors a guanidine compound of the formula:



wherein R is hydrogen or lower alkyl; *n* is from 3 to 5; and Het is an unsataurated heterocyclic nucleus selected from, the group consisting of imidazole, thiazole, isothiazole, oxazole, isoxazole, pyrazole, triazole, thiadiazole, pyrimidine, pyrazine and pyridazine which nucleus is attached through a carbon atom in said nucleus adjacent to a nitrogen atom and is unsubstituted or monosubstituted by lower alkyl, trifluoromethyl, hydroxyl, halogen or amino, or a pharmaceutically acceptable acid addition salt thereof.

3,975,531

4-(5- AND 7-)BENZOYLINDOLIN-2-ONES AND PHARMACEUTICAL USES THEREOF

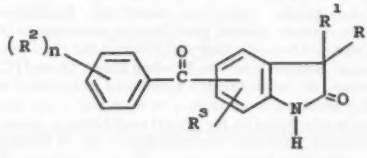
William John Welstead, Jr., and Henry Wayne Moran, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 402,700, Oct. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,284, May 17, 1972, abandoned. This application Jan. 29, 1975, Ser. No. 545,057

Int. Cl.² C07D *209/34;* **A61K** *31/40*

U.S. Cl. 424—274 **31 Claims**

1. A 4-(5- and 7-)benzoylindolin-2-one of the formula:



wherein;

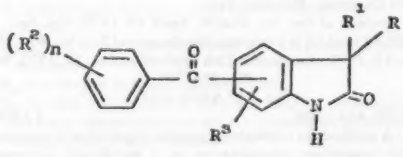
R is selected from the group consisting of hydrogen, lower-alkyl or methylthio,

R^1 is selected from the group consisting of hydrogen or lower-alkyl,

R^2 is selected from the group consisting of lower-alkyl, lower-alkoxy, halogen, nitro or trifluoromethyl,

R^3 is selected from the group consisting of hydrogen, halogen or lower alkoxy, and *n* is 0, 1 or 2.

15. A method of treating inflammation which comprises administering to an animal in need thereof an effective amount of a compound selected from the group consisting of 4-(5- and 7-)benzoylindolin-2-one of the formula:



wherein:

R is selected from the group consisting of hydrogen, lower-alkyl or methylthio,

R^1 is selected from the group consisting of hydrogen or lower alkyl,

R^2 is selected from the group consisting of lower-alkyl, lower-alkoxy, halogen, nitro or trifluoromethyl,

R^3 is selected from the group consisting of hydrogen, halogen or lower alkoxy, and *n* is 0, 1 or 2.

3,975,532

HEXAHYDRO-1H-FURO(3,4-C) PYRROLE COMPOUNDS FOR TREATING PAIN

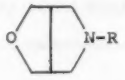
Alfred D. Miller, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 370,010, June 14, 1973, Pat. No. 3,910,950. This application Apr. 9, 1975, Ser. No. 566,418 The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **14 Claims**

1. A method of alleviating pain in a living animal comprising administering to said animal a therapeutically effective amount of a compound represented by the formula



wherein R is a radical selected from the group consisting of hydrogen; alkylene (C_1 to C_4) dicarbonyl hexahydro-1H-furo(3,4-c)pyrrole; phenylene dicarbonyl hexahydro-1H-furo(3,4-c)pyrrole; phenyl; phenylacetyl; monoalkoxy (C_1 to C_4) substituted benzoyl; phenylalkyl where the alkyl constituent thereof contains from 1 to 4 carbon atoms; alkenyl (C_3 and C_4); mono-, di-, or tri-halogen substituted phenylalkyl where the alkyl group contains from 1 to 4 carbon atoms and the halogen is substituted on the phenyl ring; benzoyl; mono-, di-, or tri-halogen substituted benzoyl; mono-, di-, or tri-alkyl (C_1 to C_4) substituted benzoyl; mono-, di-, or tri-halogen substituted phenylalkanoyl wherein the alkanoyl group contains from 2 to 4 carbon atoms and the halogen is on the phenyl ring; hexahydrobenzoyl; phenylalkenoyl wherein the alkenoyl group is a lower alkenoyl containing from 3 to 5 carbon atoms; phenylethanoyl; halogen-substituted phenoxyalkanoyl wherein the alkanoyl group contains from 1 to 4 carbon atoms and the phenoxy ring is substituted with from 1 to 3 halogen atoms; alkanoyl (C_2 to C_{18}); haloalkyl (C_1 to C_4) mono-, di-, or tri-substituted benzoyl wherein the haloalkyl group contains from 1 to 5 halogen atoms; mono- or di-hydroxyl substituted alkyl where the alkyl group contains from 1 to 4 carbon atoms; phenylsulfonyl; mono- or di-hydroxyl substituted benzoyl; nicotinoyl; mono- or di-alkanoyloxy (C_1 to C_4) substituted benzoyl; thenoyl; cycloakyl (C_4 to C_8); and a pharmacologically acceptable acid addition salt thereof.

3,975,533

THERAPEUTIC AGENTS

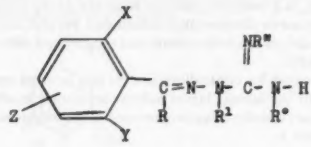
Jiro K. Kodama, Herne Bay, England; George R. Haynes, and James R. Albert, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 33,058, April 29, 1970, Pat. No. 3,658,993, which is a continuation-in-part of Ser. No. 674,753, Oct. 12, 1967, abandoned. This application Jan. 10, 1972, Ser. No. 216,775

Int. Cl.[3] A61K *31/155*

U.S. Cl. 424—326 **2 Claims**

1. A method for combatting psychic depression in mammals which comprises administering to a psychically depressed mammal in need of said treatment an effective dosage for combatting the psychic depression of the compound of the formula



wherein X is halogen or trifluoromethyl, Y and Z may be the same or different and are hydrogen, halogen, trifluoromethyl or alkyl of 1 to 4 carbon atoms, R, R′,R″ and R° each hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or alkynyl of 2 to 4 carbon atoms with the proviso that R″ and R° may together form an alkiene or alkenylene bridge of 2 to 4 carbon atoms, with the further proviso that one of Y and R must be hydrogen, or a pharmaceutically acceptable salt thereof.

3,975,534

PHARMACEUTICAL COMPOSITIONS USEFUL FOR TREATING TICK INFESTATION IN ANIMALS WHICH CONTAIN 2-ARYLIMINOPYRROLIDINES OR THEIR SALTS AS THE ACTIVE AGENT

Edgar Enders, Cologne; Wilhelm Stendel, Wuppertal-Elberfeld; Jurgen-Dietrich Meier, Cologne, and Marc Francque, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

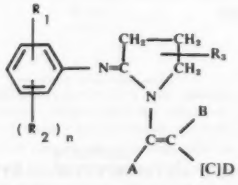
Division of Ser. No. 181,613, Sept. 17, 1971, Pat. No. 3,821,204. This application Jan. 24, 1974, Ser. No. 436,090

Claims priority, application Germany, Sept. 19, 1970, 2046413

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **132 Claims**

1. A pharmaceutical composition useful for treating tick infestation in animals which comprises an effective amount of a compound of the formula



or a salt thereof, wherein

R_1 is halogen,

R_2 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, difluoromethyl or trifluoromethyl,

R_3 is hydrogen or lower alkyl,

n is an integer from 1 to 4, and

A, B and D each represent hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, or A and B, or B and D, are linked to each other to form a ring, provided that at least one of A, B and D is alkyl or alkenyl,

in combination with a solid or liquified gaseous carrier, or in combination with a carrier containing a surface-active agent.

3,975,535

ANTI-ALLERGIC-3-CARBOXY-ISOCOUMARIN COMPOSITIONS AND METHODS OF USE

Derek Richard Buckle, Redhill; Barrie Christian Charles Cantello, Horsham, and Harry Smith, Maplehurst, near Horsham, all of England, assignors to Beecham Group Limited, England

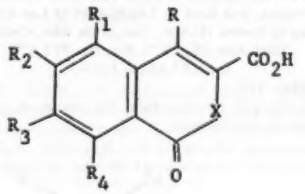
Filed Sept. 30, 1974, Ser. No. 510,803

Claims priority, application United Kingdom, Oct. 11, 1973, 47485/73

Int. Cl.² A61K *31/335*

U.S. Cl. 424—279 37 Claims

1. A pharmaceutical composition in a form suitable for oral, parenteral or insufflation administration to humans which comprises a compound of the formula (I)



(I)

or a pharmaceutically acceptable salt thereof or hydrate thereof, wherein X is O, R is hydrogen, lower alkyl, cyclopentyl, cyclohexyl or cycloheptyl; R_1, R_2, R_3 and R_4 are each hydrogen, lower alkyl, lower alkoxy, cyclohexyl, phenyl, benzyl, halogen, carboxyl, lower alkoxycarbonyl, lower alkanoyloxymethoxycarbonyl, lower α-alkanoyloxyethoxycarbonyl or acetoxy, or R_1 and R_2, R_2 and R_3 or R_3 and R_4 taken together with the carbon atoms to which they are attached form a 1,2-phenylene or 1,2-cyclohexylene ring, in an amount sufficient to be effective for the prophylaxis of asthma, hayfever, or rhinitis in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier suitable for said administration form.

3,975,536

COMPOSITION

Neil Arthur Stevenson, and George Wardell, both of Loughborough, England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 443,521, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 251,198, May 8, 1972, abandoned. This application May 17, 1974, Ser. No. 471,141

Claims priority, application United Kingdom, May 12, 1971, 14529/71; Dec. 9, 1971, 57169/71; May 25, 1973, 25237/73; May 25, 1973, 25238/73; June 5, 1973, 26649/73; July 12, 1973, 33325/73

Int. Cl.² A61K *31/35, 47/00*

U.S. Cl. 424—283 8 Claims

1. In a pharmaceutical composition which comprises a sterile aqueous solution containing 1,3-bis(2-carboxy-chromon-5-yloxy)-propan-2-ol or a pharmaceutically acceptable salt thereof as an active ingredient, the improvement according to which the said active ingredient is present in an amount of from 0.1 to 10% w/v, the said composition contains less than about 0.40 ppm of ions of metals in Groups IIa, Ib, IIb and IVb of the Periodic Table and of the transition metals, the said composition being a substantially clear, sterile aqueous solution.

3,975,537

PHARMACEUTICAL COMPOSITIONS AND METHODS OF PRODUCING CORONARY VASODILATION

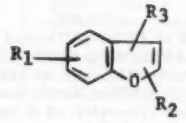
David T. Hill, North Wales, and Bernard Loev, Broomall, both of Pa., assignors to SmithKline, Philadelphia, Pa.

Continuation-in-part of Ser. No. 399,573, Sept. 21, 1973, Pat. No. 3,880,891. This application Feb. 20, 1975, Ser. No. 551,581

Int. Cl.² A61K *31/34, 31/40, 51/445, 31/535*

U.S. Cl. 424—285 17 Claims

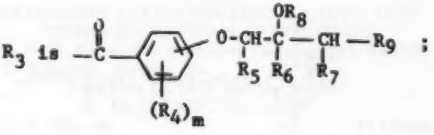
1. A pharmaceutical composition having coronary vasodilator activity, in dosage unit form, comprising a pharmaceutical carrier and, in an amount sufficient to produce coronary vasodilation, a substituted benzofuran of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

R_1 is hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl;

R_2 is hydrogen, lower alkyl or phenyl $(CH_3)_n$ where n is 0 or 1 and the phenyl moiety is optionally substituted with lower alkyl, lower alkoxy, trifluoromethyl, halogen, NH_2, NH(lower alkyl) or N(lower alkyl)$_2$;



R_4 is hydrogen, halogen, lower alkyl or lower alkoxy;

m is 1 or 2;

R_5, R_6 and R_7 are hydrogen or one of R_5, R_6 and R_7 is methyl or ethyl;

R_8 is hydrogen or lower alkanoyl; and

R_9 is NH(lower alkyl), N(lower alkyl)$_2$, NH(benzyl), N(lower alkanoyl)(lower alkyl), piperidino, pyrrolidino, morpholino or succinimido.

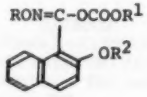
3,975,538

MITICIDALLY ACTIVE COMPOSITIONS

Toshiya Kamikado, Ashiya; Takashi Kuragano, Amagasaki; Kazuo Konishi, Osaka; Yasuo Sato, and Masayoshi Nagano, both of Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

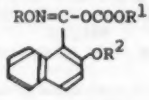
Filed June 16, 1975, Ser. No. 586,860
Claims priority, application Japan, June 14, 1974, 49-68501
Int. Cl.² A01N 9/20; C07C 69/96
U.S. Cl. 424—301 14 Claims

1. A compound of the formula



wherein R represents lower alkyl or lower alkenyl and R^1 and R^2 respectively represent lower alkyl.

14. A miticide containing as its active ingredient a miticidally effective amount of one or more of the compounds represented by the formula



wherein R represents lower alkyl or lower alkenyl and R^1 and R^2 respectively represent lower alkyl.

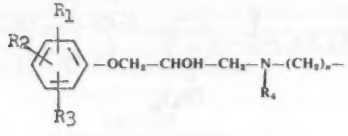
3,975,539

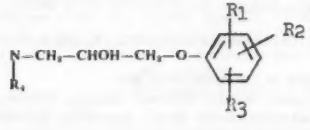
PHARMACEUTICAL COMPOSITIONS CONTAINING AN N,N-BIS-(3-PHENOXY-2-HYDROXY-PROPYL)-ALKYLENEDIAMINE AND METHOD OF USE

Herbert Köppe; Helmut Stähle; Werner Kummer; Gojko Muacevic, and Werner Traunecker, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Division of Ser. No. 336,269, Feb. 27, 1973, Pat. No. 3,888,898. This application Apr. 16, 1975, Ser. No. 568,798
Claims priority, application Germany, Mar. 6, 1972, 2210620; Dec. 11, 1972, 2260444
Int. Cl.² A61K 31/275
U.S. Cl. 424—304 6 Claims

1. A β-adrenolytic and hypotensive pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective β-adrenergic receptor blocking and hypotensive amount of a compound of the formula





wherein R_1 is $-(CH_2)_x-CN$, where x is 0,1,2 or 3.

R_2 is hydrogen, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or alkenyloxy of 2 to 5 carbon atoms;

R_3 is hydrogen, halogen, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms;

R_2 and R_3, together with each other and the carbon atoms to which they are attached, form a saturated or unsaturated carbocyclic ring of up to 6 carbon atoms;

R_4 is hydrogen, alkyl of 1 to 5 carbon atoms or aralkyl; and

n is an integer from 1 to 10, inclusive; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

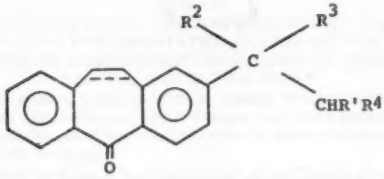
3,975,540

2-SUBSTITUTED-5-OXO-5H-DIBENZO(a,d)CYCLOHEPTENES, AND DERIVATIVES THEREOF, AND METHODS AND COMPOSITIONS FOR THE USE THEREOF

Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 28, 1975, Ser. No. 572,477
Int. Cl.² A61K 31/185
U.S. Cl. 424—315 37 Claims

1. A compound selected from the group of compounds represented by the formula:



where one of R^2 and R^3 is hydrogen and the other is hydrogen, methyl, ethyl or together R^2 and R^3 are methylene; one of R' and R^4 is —OH and the other is $-SO_3Y$ where Y is sodium or potassium, and the dotted line refers to an optional, additional bond between the carbon atoms at the 10- and 11-positions.

3,975,541

INSECT REPELLENT COMPOSITIONS HAVING AN N-SUBSTITUTED HYDROXYALKYL AMINE AS AN ACTIVE INGREDIENT

Carl Bordenca, Rocky River, Ohio; Kenneth P. Dorschner, Vienna, Va., and Robert P. Johnson, Baton Rouge, La., assignors to SCM Corporation, Cleveland, Ohio

Division of Ser. No. 470,632, May 16, 1974, Pat. No. 3,933,915, which is a continuation of Ser. No. 265,673, June 23, 1972, abandoned, which is a continuation-in-part of Ser. No. 189,464, Oct. 14, 1971, abandoned. This application June 9, 1975, Ser. No. 585,113
Int. Cl.² A01N 9/20
U.S. Cl. 424—325 4 Claims

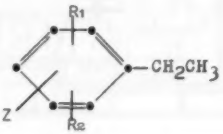
1. An insect repellent composition comprising an inert carrier and from about 0.1 to about 90% by weight of a monohydroxyalkyl amine in which (a) the hydroxyalkyl radical contains from 2 to 6 carbon atoms and has its hydroxyl group on a carbon atom not directly bonded to the amino nitrogen atom and (b) two monovalent radicals selected from the group consisting of acyclic monoterpenyl radicals, hydrogenated acyclic monoterpenyl radicals, and hydrogen, but not more than one hydrogen, are also bonded to the amino nitrogen atom.

3,975,542
ETHYL- AND VINYLBENZENES AS ANTITHROMOBIOTIC AGENTS

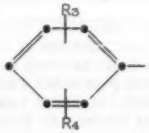
Erwin A. Stephan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 485,876, July 5, 1974, abandoned. This application May 15, 1975, Ser. No. 577,975
Int. Cl.[2] A61K *31/03, 31/015, 31/085*
U.S. Cl. 424—353 **14 Claims**

1. A method of treating vascular thrombosis in warm-blooded animals which comprises administering to a warm-blooded animal in need of such treatment an amount effective for treating vascular thrombosis of a compound of the formula,



wherein R_1 and R_2 are monovalent groups independently selected from the group consisting of hydrogen, halo, C_1–C_3 alkyl, and C_1–C_3 alkoxy, and Z is either a monovalent group which is C_3–C_7 cycloalkyl, with the proviso that at least one of R_1 and R_2 must be halo, or a group of the formula



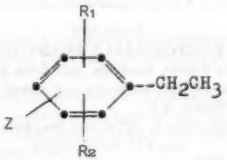
wherein R_3 and R_4 are monovalent groups independently selected from the group consisting of hydrogen, halo, C_1–C_3 alkyl, and C_1–C_3 alkoxy, with the proviso that at least one of R_1, R_2, R_3, and R_4 must be halo.

3,975,543
ETHYL- AND VINYLBENZENES AS ANTI-INFLAMMATORY AGENTS

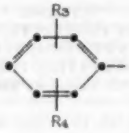
Erwin A. Stephan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 485,875, July 5, 1974, abandoned. This application June 9, 1975, Ser. No. 584,999
Int. Cl.[2] A61K *31/03, 31/015, 31/085*
U.S. Cl. 424—353 **14 Claims**

1. A method of treating inflammation in warm-blooded animals which comprises administering to a warm-blooded animal in need of such treatment an amount effective for treating inflammation of a compound of the formula,



wherein R_1 and R_2 are monovalent groups independently selected from the group consisting of hydrogen, halo, C_1–C_3 alkyl, and C_1–C_3 alkoxy, and Z is a monovalent group which is either C_3–C_7 cycloalkyl, with the proviso that at least one of R_1 and R_2 must be halo, or a group of the formula,



wherein R_3 and R_4 are monovalent groups independently selected from the group consisting of hydrogen, halo, C_1–C_3 alkyl, and C_1–C_3 alkoxy, with the proviso that at least one of R_1, R_2, R_3, and R_4 must be halo.

3,975,544
FLAVOR DEVELOPMENT BY ENZYME PREPARATION IN NATURAL AND PROCESSED CHEDDAR CHEESE

Frank V. Kosikowski, Ithaca, N.Y., assignor to Cornell University, Ithaca, N.Y.

Filed May 10, 1974, Ser. No. 468,862
Int. Cl.[2] A23C *19/12*
U.S. Cl. 426—35 **5 Claims**

1. In the method of producing cheddar cheese from pasteurized milk wherein cheddared cheese curds are prepared and the curds are then molded, dried and cured, the improvement comprising introducing into the cheddared cheese curds a mixture comprising:

a. food grade animal lipase enzyme derived from edible animal tissue,
b. food grade neutral protease enzyme derived from a mold selected from the group consisting of Aspergilli ssp., Mucor ssp., Penicillium ssp., Rhizopus ssp. and Streptomyces ssp.,
c. food grade peptidase enzyme derived from a mold selected from the group consisting of Aspergilli ssp., Streptomyces ssp., Penicillium ssp. and Rhizopus ssp., and
d. sodium chloride,
e. the amount of said lipase enzyme in said mixture being in the range to provide between 2 and 20.0 grams per 100 kg. of cheese curds, the amount of the combination of said neutral protease enzyme and peptidase enzyme in said mixture being in the range to provide between 5 and 50 grams per 100 kg. of curds and said sodium chloride being between 97 and 88% by weight of said mixture to substantially reduce the time required for curing said cheese while obtaining optimum cheese flavor and minimum bitterness and rancidity.

3,975,545
STABILIZING AGENTS FOR FROZEN LACTIC ACID PRODUCING BACTERIA COMPOSITIONS

Ebenezer R. Vedamuthu, Bradenton, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed June 16, 1975, Ser. No. 586,943
Int. Cl.[2] A23C *9/12, 19/02*
U.S. Cl. 426—40 **19 Claims**

17. The method for enhancing the lactic acid producing activity of bacteria in making cultured dairy products which comprises:

a. providing a concentrate which has been frozen and thawed for use comprising live bacterial cells which form lactic acid in milk mixed with a cell growth medium and containing a freezing stabilizing agent added after concentration of the cells including an alkali metal salt of glycerophosphoric acid in an amount sufficient to reduce damage to the cells as a result of freezing; and
b. mixing the thawed concentrate with milk to be cultured along with an additional amount of the salt of glycerophosphoric acid in an amount sufficient to cause stimula-

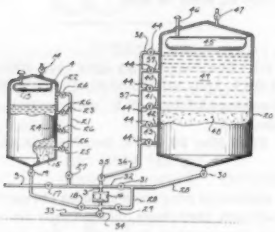
tion of the lactic acid activity of the bacteria because of the salt so as to produce the cultured dairy product.

3,975,546

COAGULATION OF PROTEIN FROM THE JUICES OF GREEN PLANTS BY FERMENTATION AND THE PRESERVATION THEREOF

Mark A. Stahmann, 939 University Bay Drive, Madison, Wis. 53705

Filed Jan. 23, 1975, Ser. No. 543,468
Int. Cl.² A23J *1/00*; A23K *1/14*; A23L *1/20*, *1/212*
U.S. Cl. 426—49 11 Claims



1. A process for coagulating and preserving proteins from the juices expressed from the stems and leaves of green plants, which comprises holding the freshly expressed juices in an anaerobic atmosphere for a predetermined length of time to form organic acids from the carbohydrates in the juices, and utilizing the microoganisms carried into the juices from the leaves of the green plants on which said microorganisms are naturally resident to effect anaerobic fermentation of the juices and the consequent lowing of the pH of the juices to increase the acid content of the juices and thereby coagulate the proteins in the juices.

3,975,547

PROCESS OF MAKING A DRY-FREE-FLOWING BEVERAGE MIX AND PRODUCT

Augustine D. D'Ercole, White Plains, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 15, 1974, Ser. No. 470,241
Int. Cl.² A23L *2/38*; C13F *5/00*
U.S. Cl. 426—106 7 Claims

1. The method of producing a dry free-flowing beverage mix containing sucrose and a significant amount up to 50% of dextrose by weight of the mix saccharides which comprises dessicating dextrose monohydrate to a moisture less than 1% and greater than 0.03%, admixing the dessicated dextrose, the sucrose and other dry beverage-making constituents including a food acid, and packaging the dry beverage mix in a packaging barrier material whose moisture transmission rate does not exceed 0.05 gms./100 sq. in./24 hours at 100°F. and 95% Relative Humidity, the mix being maintained below a moisture content of 2% preparatory to and during packaging.

3,975,548

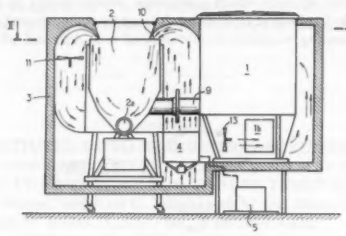
PULVERIZING PROCESS FOR THE PRODUCTION OF FROZEN MINCED MEAT

Maurice Fradin, St Jean De Monts, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Division of Ser. No. 312,563, Dec. 6, 1972, abandoned. This application Jan. 31, 1975, Ser. No. 545,956
Claims priority, application France, Dec. 8, 1972, 72.44018
Int. Cl.² A22C *5/00*, *7/00*
U.S. Cl. 426—513 3 Claims

1. The method of producing sanitized frozen minced meat which comprises the steps of:

a. pulverising meat in a first vessel;
b. passing the pulverised meat into a second vessel which is substantially closed and mixing the meat therein;
c. forcing air over a heat exchanger for cooling the air to a temperature below freezing and thus removing the water vapor therefrom by condensation;
d. forcing the cooled dry air through the meat while being mixed within the second vessel and back over the heat



exchanger in a substantially closed air circuit to condense the water vapor and germs adhered thereto by contact with the meat;
e. continuously practicing the last step while the meat is being mixed; and
f. forcing the cooled air about the first vessel for cooling the meat therein while being pulverised by conduction through the walls of said first vessel.

3,975,549

AGGLOMERATED DEHYDRATED POTATO PRODUCT AND METHOD FOR FORMING A RECONSTITUTED DOUGH-LIKE PRODUCT THEREFROM

Mounir A. Shatila and Roderick G. Beck, both of Blackfoot, Idaho, assignors to American Potato Company, San Francisco, Calif.

Continuation of Ser. No. 880,919, Nov. 18, 1969, which is a continuation-in-part of Ser. No. 814,519, April 7, 1969, Pat. No. 3,622,355. This application Sept. 23, 1974, Ser. No. 508,380
The portion of the term of this patent subsequent to Nov. 23, 1988, has been disclaimed.
Int. Cl.² A23K *1/00*
U.S. Cl. 426—550 9 Claims

1. A method for forming a reconstituted potato product suitable for shaping into bodies for french frying, comprising: providing dry agglomerates formed of dehydrated potato particles and including a binder, said agglomerates having a bulk density in the range of 0.25–0.50 grams per milliliter, a bulk porosity in the range of 0.6–0.9, and an initial moisture absorption rate during reconstitution of 0.2–0.35 grams of water per gram of product per second at 130° F; reconstituting said agglomerates in the absence of agitation physical, by combining them with sufficient water to produce a dough-like mass suitable for shaping into bodies for french frying; and thereafter shaping said dough-like mass into said bodies.

3,975,550

PLASTICALLY DEFORMABLE READY-TO-USE BATTER

Joseph Anthony Fioriti, Hastings, and John Joseph Mancuso, Astoria, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,345
Int. Cl.² A21D *10/04*
U.S. Cl. 426—553 1 Claim

1. A plastically deformable ready-to-use batter composition susceptible to spoilage in the absence of freezer storage, said composition being at a temperature of below 32°F, having a moisture content of from about 15% to about 45%, which

maintains plastic deformability at temperatures as low as 0°F, and which comprises on a dry basis:

a. from about 3% to about 15% egg,

b. from about 5% to about 35% of a polyunsaturated oil or oil blend,

c. from about 1% to about 10% of a water miscible liquid material having a freezing point below 0°F, selected from the group of edible low molecular weight alcohols, glycols and polyols,

d. from about 10% to about 25% of sugar or sugar-dextrin mixture,

e. from about 15% to about 65% flour or a flour starch mixture, and

f. an amount of leavening agent effective for leavening the product during cooking.

3,975,551

MICROBIALLY-STABLE POTATO PRODUCTS AND PROCESS

Mounir A. Shatila, Blackfoot, Idaho, assignor to American Potato Company, San Francisco, Calif.

Division of Ser. No. 159,571, July 2, 1971, Pat. No. 3,895,122. This application Feb. 7, 1975, Ser. No. 548,114

Int. Cl.² A23L *1/216*

U.S. Cl. 426—637 **6 Claims**

1. A novel article of manufacture, comprising:

substantially fully gelatinized potato pieces having a water activity of above about 0.85 containing about 200 to 700 parts per million of absorbed sulfur dioxide gas;

a sealed container enclosing said pieces, said container being substantially impermeable to microbes and oxygen; and

a substantially oxygen-free environment occupying the space in said container surrounding said pieces.

3,975,552

METHOD OF BAKING A PIZZA USING MICRO-WAVE ENERGY

Max Stangroom, Houston, Tex., assignor to National Convenience Stores, Houston, Tex.

Filed Mar. 31, 1975, Ser. No. 563,690

Int. Cl.² A21D *6/00*

U.S. Cl. 426—243 **5 Claims**

1. A method of preparing a pizza which comprises:

a. preparing a pizza dough comprising

i. from about 75 percent to about 82 percent by weight flour;

ii. up to about 5 percent by weight shortening; and

iii. from about 18 percent to about 25 percent by weight moisture;

b. shaping said dough into the shape of a pizza crust;

c. drying said pizza crust to form a dried crust of a moisture content of from about 2 percent to about 8 percent by weight moisture;

d. topping the dried crust with pizza toppings; and

e. baking said crust and pizza toppings using micro-wave energy, said crust remaining crisp throughout the cooking.

3,975,553

DEPROTEINATION OF YEAST CELLS

Henri Griffon, 2 Place Mazas, 75012 Paris, France

Continuation-in-part of Ser. No. 308,606, Nov. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,371, Sept. 11, 1970, abandoned, which is a continuation of Ser. No. 810,852, March 26, 1969, abandoned, which is a continuation of Ser. No. 532,107, March 6, 1966, abandoned. This application Sept. 13, 1974, Ser. No. 505,844

Claims priority, application France, Mar. 8, 1965, 65.8314

Int. Cl.² A23L *1/28;* **C12C** *11/26*

U.S. Cl. 426—656 **7 Claims**

1. The process of making a deproteinized yeast cell membrane product which comprises

filling to capacity a vessel solely with compressed yeast having a moisture content of about 70%,

sealing the filled vessel so that the vessel is air-tight and the yeast therein is cut off from communication with atmospheric air,

heating the yeast in the vessel to about 55°C and maintaining the yeast at about 55°C under anaerobic conditions until liquifaction and autolysis of the yeast has commenced as indicated by the yeast beginning to darken and turn brown,

thereafter lowering the internal pressure of said sealed vessel to less than atmospheric pressure and introducing an inert gas into said vessel to create a current of inert gas through the vessel and maintain said anaerobic conditions,

evaporating residual water from yeast in said vessel while continuously agitating said yeast in the presence of said current of inert gas under said lower pressure at about 55°C until the proportion of residual water in said yeast has been reduced to about 40% to 50%,

maintaining the yeast under said reduced pressure, said current of inert gas, said anaerobic conditions and said temperature until autolysis is complete and substantially more than 50% of the naturally present protein gel of the yeast cells has been expelled from within the yeast cells to form a pasty yeast product mixture of a water soluble material and deproteinated yeast cell membranes,

recovering the cell membranes from said mixture by centrifugation, and washing the cell membranes with water.

3,975,554

PROCESS FOR PRIMING

Joel S. Kummins, Stone Mountain, Ga., and John C. Smith, Jr., Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 15, 1974, Ser. No. 514,523

Int. Cl.² B05D *1/38;* **C08L** *83/04*

U.S. Cl. 427—8 **6 Claims**

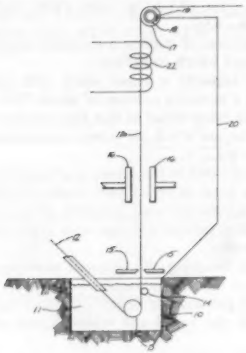
1. A process for coating a surface with a cured or a curable silicone-containing coating composition comprising applying a film-forming, silicon-containing primer composition to said surface prior to applying said coating composition thereby producing a primed surface, wherein said primer composition contains at least one primer-soluble, light-fugitive colorant which will retain at least some of its color for 24 hours and will subsequently become colorless in the presence of light, coating the primed surface with said coating composition before the primer on the surface becomes colorless and allowing any uncoated primer on the surface to become colorless in the presence of light.

3,975,555

METHOD OF MAKING ELECTRICAL CONTACTS HAVING A LOW OPTICAL ABSORPTION

Ivan Ladany, Stockton, N.J.; Albert Chang Limm, Lancaster, and James Thomas O'Brien, Leola, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 12, 1975, Ser. No. 549,494
Int. Cl.² B05D 5/12
U.S. Cl. 427—85 4 Claims



1. A method of fabricating a contact on a semiconductor article of III-V semiconductor material having a P-type region, the contact having a low electrical resistance and low optical absorption, comprising the steps of:

diffusing Zn into a surface of the P-type region of the semiconductor article,

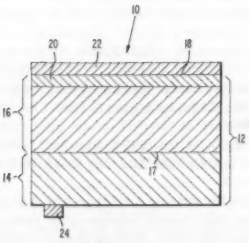
heating the article to a temperature of about 400°C, and depositing by vacuum evaporation a layer consisting essentially of gold directly onto the surface of the heated article.

3,975,556

METHOD FOR PREVENTING COATING METAL PICKUP ON HOT-DIP COATING LINE ROLLS

Marvin B. Pierson, Franklin, and Charles Flinchum, Trenton, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 19, 1973, Ser. No. 398,761
Int. Cl.² B05C 3/02
U.S. Cl. 427—122 14 Claims



1. In a method for coating strip which includes the steps of passing the strip through a bath of molten metal, controlling the thickness of the applied coat, heating the coated strip to the proper alloying temperature, and passing the heated alloyed strip into contact with a roll comprised of a material having good electrical conductivity and compatible with graphite and which roll is located above the bath, the improvement comprising the step of covering the exterior surface of said roll with an adherent graphite film, whereby to prevent metal pickup on the said roll.

3,975,557

PRODUCING AN ELECTRODE

Henry A. Kuchek, Auburn, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 2, 1975, Ser. No. 537,871
Int. Cl.² C25B 11/10
U.S. Cl. 427—126 13 Claims

1. A method for coating an electrode with an acitivating oxide comprising admixing an oxide particulate of titanium and ruthenium with a mixture consisting essentially by weight of from about 30 to about 70 percent of a titanium halide and from about 30 to about 70 weight percent of a ruthenium halide and an alcohol with a boiling temperature less than that of water; mechanically applying the oxide containing mixture to the surface of a valve metal substrate selected from the group consisting of tantalum, titanium and tungsten to coat at least a portion of the substrate with the oxide containing mixture; drying the coating; and exposing the coating to an elevated temperature for a sufficient time to oxide the titanium and ruthenium in the coating and to form in a single coating step an electrode suitable for use in the electrolytic production of chlorine and having an adherent oxide coating on at least a portion of the substrate surface.

3,975,558

METHOD FOR REPAIRING PLASTIC-LIKE MATERIALS

Lawrence Speer, 4380 Inner Cicle Drive, Brunswick, Ohio 44212

Filed Feb. 20, 1975, Ser. No. 551,084
Int. Cl.² B32B 35/00
U.S. Cl. 427—140 9 Claims

1. A process for repairing a damage in plastic or leather-like materials in which a heat-curable film-forming patching compound is applied to the damage, covered by a graining paper and heated therethrough with a flat hot surface at a temperature and for a time to cure the patching compound, including the steps of coating the undamaged material around said damage with a heat-insulating paste comprising materials which cure in the presence of a catalyst to form a heat insulating film, curing said heat insulating paste, and then adding said patching compound.

3,975,559

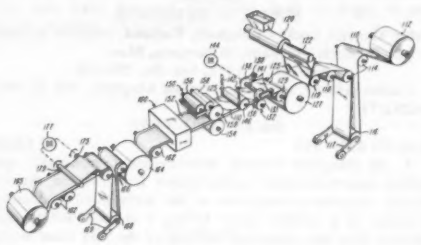
METHOD FOR PRODUCING A BUSINESS FORM ARTICLE

William T. Paulson, Kettering, Ohio; David M. Davidson, deceased, late of Dayton, Ohio, by Clara A. Davidson, executrix; L. Eldean Gilbert, West Milton, Ohio; Henry Gabbard, Xenia, Ohio, and Richard D. Bemus, Troy, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Division of Ser. No. 378,547, July 12, 1973, which is a continuation-in-part of Ser. No. 156,704, June 25, 1971, Pat. No. 3,776,755, which is a continuation-in-part of Ser. No. 800,167, Feb. 18, 1969, abandoned. This application Oct. 29, 1974, Ser. No. 518,524
Int. Cl.² B41M 5/02
U.S. Cl. 427—146 6 Claims

1. A method for producing a continuous business form article, comprising the steps of directing a carrier web along a predetermined path, extruding a continuous film of plastics material onto the web, stretching the film to decresae the thickness of the flim, producing a releasable bond between the film and the carrier web, cutting the film longitudinally in an area releasably bonded to the carrier web and between the marginal edges of the carrier web without cutting the carrier web to form a film strip, releasing and removing the film strip

from the carrier web, coating a layer of image transfer material onto at least a portion of the film on the carrier web, and



releasing the film and coated layer of image transfer material from the carrier web.

3,975,560

PHOSPHORUS AND NITROGEN CONTAINING RESINS FOR FLAMEPROOFING ORGANIC TEXTILES

Donald J. Daigle, New Orleans; Armand B. Pepperman, Jr., Metairie, and Sidney L. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,807

Int. Cl.² C09D *5/18;* **C07F** *9/50*

U.S. Cl. 427—341 **2 Claims**

1. A process for flameproofing organic textiles comprising:
   a. reacting a hydroxymethyl phosphorus compound with a nitrogenous compound to form an insoluble polymeric precipitate,
   b. dissolving the precipitate from (a) in the presence of formaldehyde and an inorganic or organic acid with a mole ratio of 1:4 to 4:1 of formaldehyde to phosphorus contained in the precipitate and a 1:10 to 2:1 ratio of acid to phosphorus contained in the precipitate,
   c. reacting the soluble polymer adduct from (b) with a nitrogenous compound,
   d. wetting a textile fabric with a solution of (c),
   e. drying the wetted fabric from (d) at a temperature from 90°–170°C, and
   f. contacting a fabric wetted with a solution comprising (b) with ammonia or methylamine.

3,975,561

PHOTOPOLYMER IMAGE INLAYS

Richard C. Knudson, 4330 Lynne Lane, Salt Lake City, Utah 84117, and John R. Bolton, 1528 Vine St., Belmont, Calif. 94002

Filed Nov. 21, 1974, Ser. No. 525,860

Int. Cl.² G03C *1/68;* **B44F** *1/06;* **B32B** *27/36*

U.S. Cl. 428—67 **10 Claims**

1. A solid photopolymeric image inlay article comprising a solidified synthetic rock-like matrix of a mixture of a filler material and a thermosetting resin coated with a thin layer of a resilient polyester resin said coated matrix having inlaid therein a photopolymeric image.

3,975,562

TEXTILE FLOOR COVERING WITH BOTTOM OF THERMOPLASTIC FOAM AND A METHOD OF PRODUCING IT

Karl-Heinz Madebach, Leuna; Otto Wittenburg, Halle-Neustadt; Gerd Wilde, Halle-Neustadt; Werner Taube, Halle-Neustadt; Werner Lauterberg, Halle-Neustadt; Dieter Barthel, Leuna; Dieter Pape, Merseburg; Gerhard Gerstner, Berga, and Joachim Antemann, Gera, all of Germany, assignors to VEB Leuna-Werke "Walter Ulbricht", Leuna, Germany

Filed Jan. 31, 1975, Ser. No. 545,951

Claims priority, application Germany, Mar. 3, 1974, 177179; Feb. 8, 1974, 176466; May 3, 1974, 178263

Int. Cl.² D03D *27/00;* **D04H** *11/00;* **D05C** *17/00*

U.S. Cl. 428—95 **14 Claims**

1. A textile floor covering consisting of a textile layer constituted of a pile and a textile carrier layer for the pile and foamed thermoplastic sheeting directly connected to and in contact with the textile layer, the thermoplastic being selected from the group consisting of polyethylene, copolymers of ethylene and vinyl acetate and mixtures of polyethylene and copolymers of ethylene and vinyl acetate, the foamed thermoplastic sheeting having a thickness of from 1.5 to 10 mm. and a density of from 0.10 to 0.40g./cm.³.

3,975,563

IMAGE TRANSFER SHEET MATERIAL

Victor R. Franer, Roseville, and Darrell C. Burman, Bethel, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 8, 1974, Ser. No. 467,898

Int. Cl.² B41M *5/26;* **B32B** *7/02, 31/26;* **B41M** *3/12*

U.S. Cl. 428—143 **10 Claims**

1. Sheet material useful in image transfer techniques comprising:
   a. a thin, flexible backing which is transparent to infrared radiation;
   b. a continuous, heat-fusible, visually opaque first layer coated over one major surface of said backing, said first layer having a softening point in the range of about 60°C. to 310°C., said first layer having an optical density between 0.2 and 0.7 in the infrared wavelength range, and said first layer being at a coating weight in the range of about 0.4 to 1.3 grams per square foot; and
   c. a continuous, non-tacky, heat-fusible, infrared-transparent second layer coated over said first layer, said second layer having a softening point at least as high as said first layer, said second layer being at a coating weight in the range of about 0.1 to 0.7 grams per square foot, and said second layer having a matte surface.

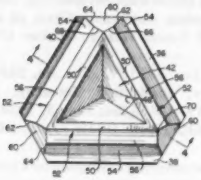
7. Sheet material useful in image transfer techniques comprising:
   a. a thin, flexible backing which is transparent to infrared radiation;
   b. a continuous, heat-fusible, infrared-transparent, visually-transparent first layer coated over one major surface of said backing, said first layer having a softening point in the range of about 60°C. to 310°C., and said first layer being at a coating weight in the range of about 0.4 to 1.3 grams per square foot; and
   c. a continuous, non-tacky, heat-fusible, infrared-transparent second layer coated over said first layer, said second layer having a softening point at least as high as said first layer, said second layer being at a coating weight in the range of about 0.1 to 0.9 grams per square foot, and said second layer having a matte surface.

3,975,564

RESILIENT SPACER PAD FOR AN ARTICLE IN A BOX

William C. Jones, 3 Grady Lane, New York, N.Y. 11727

Filed Sept. 13, 1974, Ser. No. 505,879
Int. Cl.² B32B *1/00*; B65D *81/04*
U.S. Cl. 428—174 7 Claims



1. A pad of resilient material having single sheet thickness adapted for use as a resilient spacer positioned between an outer corner of a box or the like and an inner article, the corner of the box having trihedral walls with three junctures between the walls; said pad comprising:

outer base sidewalls in the form substantially of a frustum and having an outer base edge adapted to contact the trihedral walls angularly between adjacent box wall junctures when seated in the box corner, said outer base means having an inner edge disposed inwardly of said outer base edge; and a shaped socket disposed inwardly of said inner base edge for receiving an article, said socket being integrated with said inner edge, contiguous with and bounded by said outer base.

3,975,565

FIBROUS STRUCTURE

Matthew Giles Kendall, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 21, 1974, Ser. No. 516,805
Claims priority, application United Kingdom, Oct. 30, 1973, 50.313/73; Jan. 4, 1974, 5019/74
Int. Cl.² B32B *5/06*
U.S. Cl. 428—284 7 Claims

1. A composite structure consisting essentially of a plurality of interlayered inorganic fiber mats and organic fiber webs held together over the greater part of their areas by needled fibers from at least one of the said webs, said needled fibers extending at least part way through one or more of the mats in the thickness direction thereof, sufficient to hold the composite together, said inorganic fibers being staple polycrystalline alumina or zirconia fibers having an average diameter of 0.5 to 5 microns, and said structure having a punch density of 60 to 260 per square inch.

3,975,566

WOVEN POLYESTER FABRIC TREATED WITH AN AMINOPLAST/WATER-SOLUBLE POLYESTER RESIN COMPOSITION

Eugene M. Holda, Glen Ellyn, and John C. Lark, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 19, 1974, Ser. No. 534,158
Int. Cl.² B32B *27/00*
U.S. Cl. 428—290 5 Claims

1. Polyester fabric having improved bulk density comprising a polyester fabric bearing a dried composition comprising an aminoplast and a water-soluble polyester resin having a molecular weight of not more than about 4,000 and an acid number of at least 35 which comprises (1) a branched chain three-dimensional polyester core having an acid number less than about 25 comprising the reaction product of a polyhydroxyl compound, dicarboxylic acid compound, monocarboxylic acid compound and polycarboxylic acid compound having at least three acyl moieties and (2) pendant carboxylic acid moieties comprising polycarboxylic acid compounds having at least three acyl moieties, wherein said polyester resin contains no non-benzenoid unsaturation and none of the hydroxyl compounds have secondary hydroxyl groups.

3,975,567

SURGICAL DRESSINGS

Peter Maurice Lock, Gillingham, England, assignor to Ionics Lyo Products Company, Watertown, Mass.

Filed Oct. 5, 1972, Ser. No. 295,236
Claims priority, application United Kingdom, Oct. 5, 1971, 46252/71
Int. Cl.² A61L *15/01*
U.S. Cl. 428—315 5 Claims

1. An integrally formed, non-laminated, non-rigid, open celled non-resticulated polyurethane foam wound dressing article wherein at least one of the surfaces of said article consists of a surface layer having a density substantially greater than the remaining portions of the said foam article; said dense surface layer being absorbent to aqueous based liquids in a manner and amount substantially similar to conventional cotton gauze or cottom wool wound dressings and comprised of open foam cells which are irreversibly partially collapsed as contrasted to the foam cells of said remaining portions of the article which are substantially uncollapsed and non-absorbent to aqueous based liquids.

3,975,568

LOW-FRICTION, WEAR-RESISTANT MATERIAL AND PROCESS FOR MAKING THE SAME

Robert G. Rudness, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 243,424, April 12, 1972, abandoned. This application Oct. 30, 1974, Ser. No. 519,200
Int. Cl.² B32B *15/08*
U.S. Cl. 428—329 4 Claims

1. A material for use in contacting moving Fourdrinier paper machine synthetic fabric forming wires comprising substantially uniformly dispersed spheroidal to spherical shaped wear resistant particles embedded in a plastic matrix and said particles forming a tightly packed monolayer which forms a wear surface, said plastic matrix being formed from a plastic taken from the class consisting of thermoplastic and thermosetting resins and said particles being selected from at least one of the group consisting of metal oxides, metal carbides, metal borides, metal silicides and metal nitrides with said particles being sized between about 10 and about 50 mesh USA sieve size with a surface roughness between 1 and about 70 microinches RMS.

3,975,569

MAGNETIC RECORDING ELEMENT

Akihito Sugimatsu, Tokorozawa; Makoto Yorozu, Tokyo; Tadayoshi Nomura, Shiki; Isamu Yoshino, Kunitachi, and Hachiro Yoshikawa, Tokyo, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 346,983, April 2, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,332
Claims priority, application Japan, Apr. 4, 1972, 47-33143
Int. Cl.² B32B *5/16*; C04B *35/26*; B32B *21/06*
U.S. Cl. 428—329 1 Claim

1. A magnetic recording element suitable for use in an automatic ticket vending unit and an automatic ticket checking and collecting unit which consists essentially of a substrate of sheet paper and a layer coated thereon, said layer consisting essentially of 100 parts by weight of ferrite particles, 1 to 2 parts by weight of a dispersing agent for the ferrite having a particle size of 0.5 to 1 micron, said dispersing agent selected from the group consisting of sodium pyrophosphate, sodium hexametaphosphate, sodium polyphosphate and sodium lignosulfonate; 5 to 15 parts by weight of an alkaline modified

protein, said alkaline modified protein selected from the group consisting of alkaline modified milk casein and alkaline modified soybean protein; 15 to 30 parts by weight of a rubber-like synthetic polymer selected from the group consisting of poly(styrene-butadiene), poly(acrylonitrile-butadiene) and acrylic resin; and 1 to 2 parts by weight of a hardening agent for said protein, said hardening agent selected from the group consisting of aminoaldehyde resin and modified polyamide resin, said layer disposed onto said sheet of paper in an amount of about 35 to 55 g/m².

3,975,570

ADHESIVE TAPES HAVING A PRESSURE SENSITIVE ADHESIVE COMPOSITION CONTAINING HYDROXYETHYL CELLULOSE

Tomoyoshi Ono, Hino, and Yoshihiko Matsuguma, Hachioji, both of Japan, assignors to Teijin Limited, Japan

Division of Ser. No. 419,068, Nov. 26, 1973, Pat. No. 3,928,262. This application June 27, 1975, Ser. No. 590,923
Claims priority, application Japan, Dec. 21, 1972, 47-127626

Int. Cl.² B32B *23/08;* **C08L** *1/26*

U.S. Cl. 428—355 **2 Claims**

1. A breathable adhesive tape or drape having a gas- and moisture-transmissible adhesive layer adhered to a gas- and moisture-transmisible sheetlike substrate, said adhesive layer comprising, of the total composition of 100 parts by weight, 90 – 99 parts by weight of a tacky copolymer obtained by copolymerizing

a. 75 – 95 mol% of at least one alkyl acrylate, the alkyl group of which contains 1 to 14 carbon atoms and the average number of which carbon atoms is 4 to 12, or a mixture of at least one class of said alkyl acrylate with methyl methacrylate and/or vinyl acetate in a molar ratio of 5 or more to 1; with

b. 5 – 25 mol% of acrylic acid and/or methacrylic acid, and 10 – 1 parts by weight of a hydroxyethyl cellulose.

3,975,571

SELF-BONDING MAGNET WIRE

Munetaka Kawaguchi, Nagoya, and Yoshinobu Ueba, Osaka, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 28, 1975, Ser. No. 626,002
Claims priority, application Japan, Oct. 25, 1974, 49-123758

Int. Cl.² H01B *3/30;* **H01F** *5/06*

U.S. Cl. 428—371 **11 Claims**

1. A self-bonding magnet wire comprising a conductor core, an insulating intermediate layer and an outer layer of a baked mixture of nylon copolymer (A) and nylon copolymer (B), where the proportion of nylon copolymer (A) and nylon copolymer (B) is 50 – 95 parts of (A) to 50 to 5 parts of (B) (by weight), nylon copolymer (A) being alcohol-insoluble and non-swellable by an alsohol at room temperature and containing nylon-12, and nylon copolymer (B) having a lower melting point than that of the nylon copolymer (A).

10. A coil for use as a yoke coil for television sets comprising the self-bonding magnet wire according to claim 1.

3,975,572

THIN, TOUGH, STABLE, MAR-RESISTANT LAMINATE

George Edward Power, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,469
Int. Cl.² B32B *21/06, 27/04*

U.S. Cl. 428—452 **13 Claims**

1. A unitary heat and pressure consolidated laminated article comprising, in superinposed relationship,

A. at least one paper sheet impregnated with a substantially completely cured resinous composition, which, in its uncured state, comprises a mixture of (a) and (b), said (a) comprising a polymer of

1. from about 75% to about 98%, by weight, based on the total weight of polymer (a), of a polymerizable acrylic monomer and

2. from about 2% to about 25%, by weight, based on the total weight of polymer (a), of an acrylic monomer which is different from and copolymerizable with (1) and contains a functional group comprising carboxyl, amide or hydroxyl groups, and said (b) comprising

3. a thermosetting melamine/formaldehyde resin having a ratio of melamine to formaldehyde ranging from about 1 : 1.6 to about 1 : 2.5, respectively, the ratio of melamine in said (b) to polymer (a) ranging from about 4 : 1 to about 0.5 : 1, respectively,

B. a decorative sheet, with its decorative side facing upwardly, impregnated with a substantially completely cured resinous composition which, in its uncured state, comprises a mixture of (c) and (d), said (c) comprising a polymer of

4. from about 75% to about 98%, by weight, based on the total weight of polymer (c), of a polymerizable acrylic monomer and

5. from about 2% to about 25%, by weight, based on the total weight of polymer (c), of an acrylic monomer which is different from an copolymerizable with (4) and contains a functional group comprising carboxyl, amide or hydroxyl groups, and said (d) comprising

6. a thermosetting melamine/formaldehyde resin having a ratio of melamine to formaldehyde ranging from about 1 : 1.6 to about 1 : 2.5, respectively, the ratio of melamine in said (d) to polymer (c) ranging from about 4 : 1 to about 1 : 1, respectively, and

C. a clear, thermoset cross-linked resinous coating, directly applied to the upward face of said decorative sheet, comprising a composition, which, in its thermosetting, noncross linked state, comprises a mixture of (e), (f) and (g) said (e) comprising a polymer of,

7. from about 75% to about 98%, by weight, based on the total weight of polymer (e), of a polymerizable acrylic monomer and

8. from about 2% to about 25%, by weight, based on the total weight of polymer (e), of an acrylic monomer which is different from and copolymerizable with (7) and contains a functional group comprising carboxyl, amide or hydroxyl groups, said (f) comprising

9. from about 10% to about 100%, by weight, based on the total weight of said (8), of a highly alkoxymethylated melamine, and said (g) comprising

10. from about 5.0% to about 40.0%, by weight, based on the total weight of resin solids in (C), of andalusite, pyrophyllite or mixtures thereof.

3,975,573

POLYESTER FILM COATED WITH AN INORGANIC COATING AND WITH A VINYLIDENE CHLORIDE COPOLYMER CONTAINING A LINEAR POLYESTER RESIN

Ralph Oliver Ranck, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 377,087, July 6, 1973, Pat. No. 3,896,066, which is a continuation-in-part of Ser. No. 356,442, May 2, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,941

Int. Cl.² B32B *27/36, 27/30*

U.S. Cl. 428—480 **3 Claims**

1. A polyester film having an inorganic coating and an overcoating of a continuous, adherent, tack-free, heat-sealable coating containing:

1. a copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer copolymerizable therewith, said copolymer containing at least 80% by weight of vinylidene chloride, and
2. about 0.1 to 6% by weight, based on said vinylidene chloride copolymer, of a linear film-forming polyester having a molecular weight of at least about 500 prepared by condensing a glycol and a polyfunctional acid, at least 70% by weight of said polyfunctional acid being an aromatic polyfunctional acid.

3,975,574

MAGNETIC COATINGS FOR CREDIT CARDS

William M. Saluke, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 176,738, Aug. 31, 1971, abandoned. This application Oct. 13, 1972, Ser. No. 298,719

Int. Cl.² G11B *5/70*

U.S. Cl. 428—483 **3 Claims**

1. A credit card comprising a polyvinyl chloride or polyvinyl chloride-polyvinyl acetate copolymer credit card base with a magnetic coating thereon wherein the magnetic coating is a dry mixture of magnetic pigment in a polyvinyl chloride-polyvinyl acetate copolymer binder, wherein the ratio by weight of the pigment to the binder ranges from 3:1 to 1:3, and wherein the binder and the credit card base are interbonded one to another by interfusion of the surfaces of the binder and the credit card base.

ELECTRICAL

3,975,575
ROTATABLE FURNACE POT FOR SMELTING FURNACES

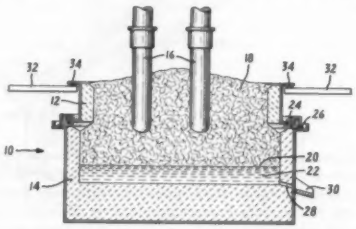
Harald Krogsrud, Gjettum, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Apr. 23, 1975, Ser. No. 570,799

Claims priority, application Norway, Apr. 25, 1974, 1500/74

Int. Cl.² F27D *3/00*

U.S. Cl. 13—10 **12 Claims**



1. In an electric smelting furnace, a furnace pot, said furnace pot being divided into upper and lower wall segments each of which comprises at least 25% of the height of the furnace pot, said wall segments of the furnace pot being rotatable with respect to each other.

3,975,576
ROTATABLE FURNACE POT INCLUDING STOKING MEANS

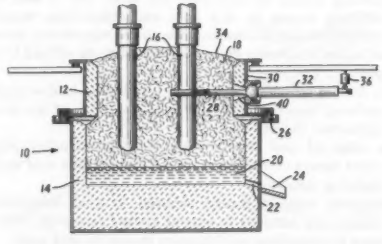
Harald Krogsrud, Gjettum, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Apr. 23, 1975, Ser. No. 570,800

Claims priority, application Norway, Apr. 25, 1974, 1501/74

Int. Cl.² F27D *3/00*

U.S. Cl. 13—10 **18 Claims**



1. In a smelting furnace, a smelting pot, said smelting pot being divided into upper and lower wall segments each of which is at least 25% of the height of the electric smelting pot, the upper wall segment being stationary and the lower wall segment being rotatable, at least one stoking member which passes through an opening in the wall of the upper stationary wall segment at a height below a maximum height to which said upper wall segment is operative to enclose charge and means for effecting movement of said stoking member.

3,975,577
COMPOUND MELTABLE ELECTRODE FOR MANUFACTURING METAL ARTICLES BY REMELTING UNDER ELECTROSLAG

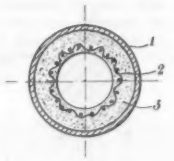
Aldo Ramacciotti; Eugenio Repetto, both of Genoa, and Paolo Sommovigo, La Spezia, all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed May 13, 1975, Ser. No. 576,994

Claims priority, application Italy, June 4, 1974, 51379/74

Int. Cl.² H05B *7/07*

U.S. Cl. 13—18 **9 Claims**



1. A compound meltable electrode for manufacturing metal articles by remelting under electroslag, characterized in consisting of a meltable metal tube on the internal surface of which is arranged a meltable layer consisting of metal powder and a binder and a slag, into the thickness of said meltable layer being let a reinforcing meltable metal element, consisting of at least one layer of metal net.

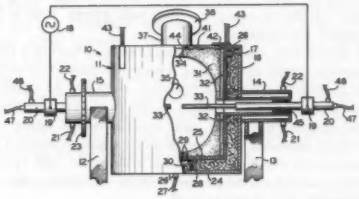
3,975,578
INDIRECT ARC METAL MELTING FURNACE METHOD

Herbert Greenewald, Jr., 4296 Braunton Road, Columbus, Ohio 43220

Continuation-in-part of Ser. No. 479,105, June 13, 1974, abandoned, which is a division of Ser. No. 355,285, Apr. 27, 1973, Pat. No. 3,821,455. This application June 3, 1975, Ser. No. 583,249

Int. Cl.² H05B *7/22*

U.S. Cl. 13—34 **5 Claims**



1. In a method of operating an indirect arc furnace of the type having separated electrodes projected from electrode terminals into a crucible interior during melting of a contained metal charge, the combined steps of:

a. providing a water-free, oxygen-free, ionizable atmosphere within said crucible interior in a zone separating said interiorly projected electrodes;

b. flowing alternating current electrical energy through said electrodes and as between said electrode terminals at a constant voltage, at high electrical current densities, and at a power factor of approximately one apparent to said electrode terminals; and

c. establishing a preferred level of electrical power input to said furnace during melting of said contained metal

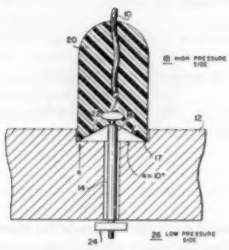
charge by controlling the separation between said interiorly projected electrodes.

3,975,579

CONICAL FACE-SEAL FOR AN ELECTRICAL FEEDTHROUGH

Sheridan Davis, Bedford, and Donald C. Cheever, Mount Vernon, both of N.H., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1975, Ser. No. 637,450
Int. Cl.² H01B *17/30*
U.S. Cl. 174—18 **19 Claims**



9. A method for sealing an electrical feedthrough into a housing which is subject to large differential pressure comprising the steps of:

inserting a tension means through a hole in the housing so that one end protrudes out on the high pressure side of the housing;

coupling an electrical conductor through the housing from its high pressure side by way of the hole in said housing;

molding an epoxy seal around and bonding it to the protruding end of said tension means and extending it around annd bonding it to a portion of said electrical conductor, said epoxy seal being molded at its underface adjacent to said housing to have a conical recess extending around the protruding end of said tension means for a predetermined portion of its length, said epoxy seal being made from a material with a suitable flexural strength so that the edges of the conical recess can deform; and

securing the end of said tension means on the low pressure side of the housing so that said epoxy seal is forced against the housing;

said epoxy seal, due to its conical recess, having a thin ring interface with the housing which deforms when subjected to pressure to act as a pressure amplifier to significantly increase the seal pressure as the pressure differential on the housing increases, said conical recess being molded with an included angle sufficiently small to prevent tensile stresses in the hoop direction induced in said epoxy seal when subjected to pressure from exceeding the tensile strength of said epoxy seal.

14. A face-seal for a feedthrough into a bulkhead which is subject to large differential pressures comprising:

feedthrough means extending through a hole in said bulkhead and having one end protruding out on the high pressure side of said bulkhead and having its other end secured at the low pressure side of said bulkhead; and

epoxy seal means with a conical undersurface mating with said bulkhead at the point where said feedthrough means protrudes on said high pressure side of said bulkhead, said seal means being molded around and bonded to said protruding end of said feedthrough means;

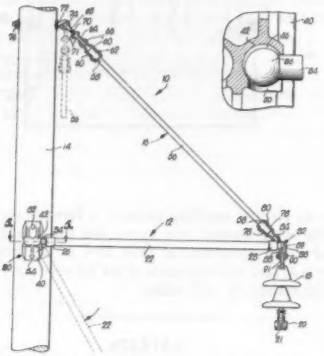
said seal means, due to its conical undersurface, having a thin ring interface with said bulkhead which deforms when subject to external pressure so that the seal pressure is amplified, said conical recess having side vertex angles sufficiently small to prevent tensile stresses in the hoop direction induced in said epoxy seal when subjected to pressure from exceeding the tensile strength of said epoxy seal.

3,975,580

ARTICULATED CROSSARM ASSEMBLY FOR ELECTRICAL CONDUCTOR SUPPORT STRUCTURE

Paul E. Lewis, Mexico, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed May 8, 1975, Ser. No. 575,828
Int. Cl.² H02G *7/20;* **E04H** *12/24*
U.S. Cl. 174—45 R **11 Claims**



1. A crossarm assembly adapted to be mounted on an upright pole for supporting an elongated line therefrom, said assembly comprising:

elongated arm-defining means having an inner end and an outer end;

means on said arm-defining means for supporting said line;

mounting means for attaching the inner end of said arm-defining means to said pole and comprising separate, complemental attachment structures respectively secured adjacent said inner end and adapted to be affixed to said pole,

one of said attachment structures including hollow socket-defining structure having at least a portion of the normal underside thereof open,

the other of said attachment structures including attachment means complementally received within said socket-defining structure;

elongated support means secured to said arm-defining means and adapted to extend toward said pole; and

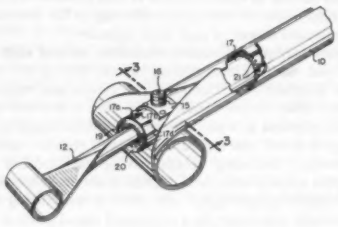
means for attaching said support means to said pole,

said socket-defining structure and attachment means being cooperatively configured for relative movement therebetween during both the installation and use of said assembly on said pole as a support for said line in order to allow the assembly to initially orient itself as needed for supporting said line without creation of significant bending loads thereon, and for allowing said arm-defining means to swing downwardly upon failure of said support means with the attachment means remaining within said socket-defining structure and the opening in the underside of the latter accommodating said downward swinging.

3,975,581
TRANSMISSION LINES USING TUBULAR EXTENDIBLE STRUCTURES

Herman Lowenhar, 422 Hudson St., New York, N.Y. 10014

Filed Sept. 24, 1973, Ser. No. 400,201
Int. Cl.² H03H 7/38
U.S. Cl. 333—33 42 Claims

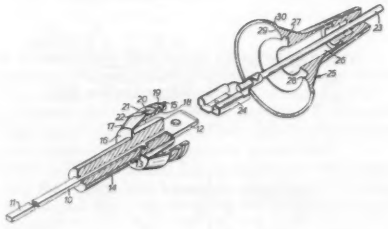


1. A collapsible and extendible coaxial transmission line comprising first and second tubular self-extendible elements of different cross-sectional areas, each of said elements comprising a separate web of prestressed material of the type which curls when unrolled from a roll in a relatively flat shape into a tubular configuration, each of said first and second tubular extendible elements including means for propagating radio frequency energy, the curled tubular portion of one extendible element being of a smaller cross-sectional size than the curled tubular portion of the other extendible element, means locating said tubular portion of said one extendible element being within the tubular portion of the other extendible element and spaced therefrom along its length to define a coaxial transmission line, and means for coupling radio frequency energy to the energy propagating portions of said first and second extendible elements.

3,975,582
FLUID LEVEL SENSING PROBE

David Julian Ford, Stapleford, England, assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 4, 1974, Ser. No. 520,851
Claims priority, application United Kingdom, Nov. 5, 1973, 51180/73
Int. Cl.² G08B 5/22; H01B 17/30
U.S. Cl. 174—153 R 7 Claims

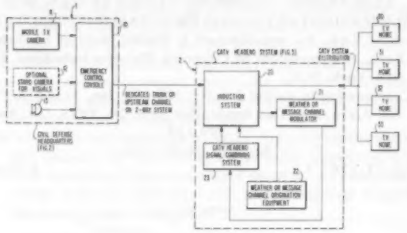


1. A probe for use in a fluid sensing system comprising an elongate electrode and an insulating connector disposed on the electrode, the connector being seated in an opening in a wall of a fluid container and including an electrode carrying bushing and an integral resilient, container wall-engaging shroud, the container wall-engaging shroud including a cylindrical seating disposed between two integral annular abutments, the electrode carrying bushing being seated in the container and supporting the electrode within the container in spaced relation to the wall of the container, the seating on the container wall-engaging shroud being resiliently tensioned against the wall of the container which circumferentially bounds the opening therein and the abutments being disposed on opposite sides of the container wall to position the seating in register with the opening a cap detachably secured to the container wall engaging shroud, the cap having an aperture therein through which an external circuit conductor is threaded and connected with the electrode and including a resilient internal rim which is snapped into and sealingly seated in a groove formed externally on the connector.

3,975,583
EMERGENCY CIVIL DEFENSE ALARM AND COMMUNICATIONS SYSTEMS

Talmadge W. Meadows, Decatur, Ala., assignor to First National Bank of Decatur, Alabama, Decatur, Ala.

Filed Oct. 7, 1974, Ser. No. 512,968
Int. Cl.² H04N 7/18
U.S. Cl. 178—5.6 12 Claims



3. In a cable television system wherein plural television signals are respectively received for normal distribution to television receivers, over respective channels assigned thereto, an apparatus for pre-empting said distribution of television signals to said receivers comprising;

first means, located at a control station, remote from the cable television distribution system, for generating an interrupting signal and for supplying said interrupting signal to said cable television distribution system to cause said cable television distribution system to interrupt the normal distribution of said television signals over said respective channels, and for generated and supplying to said cable television distribution system selected television signals; and

second means responsive to said interrupting signal and coupled directly to said cable television distribution system, for causing said distribution system to supply said selected television from said first means over each of said channels to said television receivers.

3,975,584
DITHER THRESHOLD GENERATORS

Pat LeMar Gordon, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

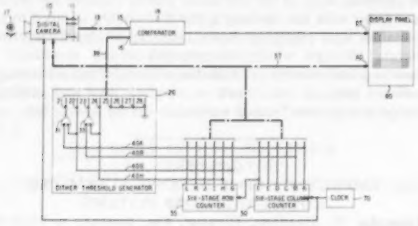
Filed Sept. 22, 1975, Ser. No. 615,770
Int. Cl.² H04N 7/12
U.S. Cl. 178—6 24 Claims

1. A dither threshold generator for use in a system for dither processing a matrix of scanned image picture elements, said generator comprising

means for providing a pair of binary numbers respectively indicative of first and second coordinate positions of a selected one of said picture elements within a selected submatrix of said picture element matrix,

first means for generating first and second bi-level dither threshold bits exclusively in response to the least-signifi-

cant bits of said binary numbers, and



second means for generating third and fourth bi-level dither threshold bits exclusively in response to the second-least-significant bits of said binary numbers.

3,975,585

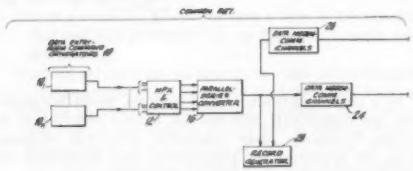
ELECTRONIC COMMUNICATIONS SYSTEM FOR SUPPLEMENTARY VIDEO PROGRAM DISTRIBUTION

Donald Kirk, Jr., and Michael J. Paolini, both of St. Petersburg, Fla., assignors to Columbia Pictures Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 328,377, Jan. 31, 1973, Pat. No. 3,916,091. This application Sept. 20, 1973, Ser. No. 399,129

Int. Cl.² H04N *1/44*

U.S. Cl. 178—5.1 **5 Claims**



1. A communication system for selectively enabling at least one predetermined subscriber of a plurality of subscribers to utilize information signals transmitted thereto by way of at least one secure channel of a transmission path, the selective enabling of the subscriber being in response to predetermined control signals transmitted over the transmission path which are distinct for each subscriber, comprising:

a. at least one control system including:

1. means for propagating the information signals on the secure channel of the transmission path;
2. means for sending the predetermined control signals in the form of a binary coded decimal including a series of a binary logical bits by way of the transmission path, the predetermined control signals for each different predetermined subscriber including at least,
   i. a synchronizing signal portion made up of a first predetermined series of binary bits,
   ii. an address signal portion made up of a second predetermined series of binary bits which is different for each different predetermined subscriber, and
   iii. a command signal portion made up of a third predetermined series of binary bits for selectively enabling only the subscriber corresponding to the address signal to utilize the information signals, the command signal portion being different for each different secure channel; and

b. a plurality of means each associated with a different predetermined subscriber for enabling a predetermined subscriber to utilize the information signals transmitted by way of the secured channel of the transmission path in response to the predetermined control signals transmitted over the transmission path which are distinct for the predetermined subscriber, the enabling means including:

1. a shift register for receiving and storing the series of logical bits from said means for sending;
2. coincidence means coupled to a selected position of said shift register and providing a first output signal responsive to a predetermined synchronizing signal portion being received in said selected position within said shift register;
3. means having an input coupled to said coincidence means and responsive to said first output signal for resetting all but selected stages of said shift register;
4. address recognizing means connected to said shift register, said address recognizing means having an enable input coupled to said coincidence means and responsive to said first output signal to provide a second output signal response to a predetermined address signal portion being received and stored in said shift register; and
5. command decoding means having an enabling input coupled to said address recognizing means responsive to said second output signal, said address recognizing means selectively responsive to a command signal portion being received and stored in said shift register; and
6. secured channel control means responsive to said command decoding means for enabling utilization of information on said secure channel corresponding to said command signal portion; and

c. said means for enabling a predetermined subscriber to utilize the information signals transmitted by way of the secured channel includes a local oscillator for selectively converting said secured channel signal to a frequency receivable by said subscriber, said local oscillator having a tank circuit the resonant frequency of which controls the frequency output of said oscillator, said oscillator including: a resonant piezoelectric crystal connected in said tank circuit, said crystal being capable of resonance within a narrow frequency band to render said tank circuit resonant only within a narrow frequency band.

3,975,586

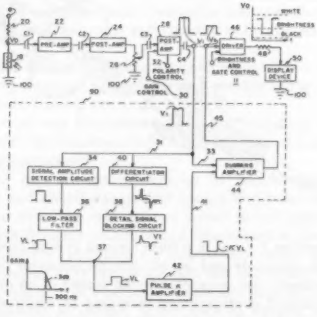
AUTOMATIC LOW FREQUENCY GAIN LIMITED CIRCUIT FOR ELIMINATING SIGNAL SUPPRESSION IN AN A-C COUPLED VIDEO PROCESSING SYSTEM

Sen-Te Chow, and John J. Pupich, both of Alexandria, Va., assignors to The United States of America as represnted by the Secretary of the Army, Washington, D.C.

Filed June 16, 1975, Ser. No. 587,518

Int. Cl.² H04N *5/20, 5/52*

U.S. Cl. 178—7.5 R **7 Claims**



1. An automatic low frequency gain limiting circuit for limiting the amplitude of the low frequency pedestal component of a video signal in an A-C coupled video processing system, said automatic low frequency gain limiting circuit comprising:

in a parallel network;

a first leg having a serially connected video signal detector and low pass filter means therein for providing a non-detail information reduced height pedestal,

a second leg having serially connected differentiator circuit and detail signal blocking circuit means for providing trigger pulses simultaneously with the changing level edges of said reduced height pedestal,

a summing node for summing the output from said first and second legs of said parallel network to produce a square wave pedestal;

a negative input pulse amplifier having said square wave pedestal applied at the input thereto for providing an amplified and inverted square wave pulse therefrom; and

a summing amplifier for simultaneously summing said video signal and said inverted square wave pulse to provide an output video signal therefrom that retains the high frequency detail information thereon but has an amplitude limited low frequency pedestal to maintain operation of said video processing system within its dynamic range.

3,975,587

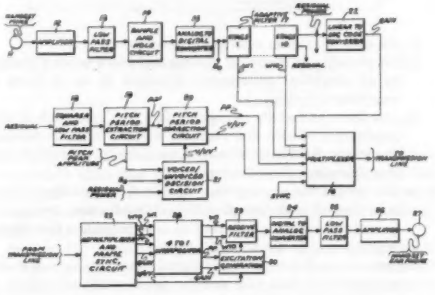
DIGITAL VOCODER

James Grant Dunn, Montclair, N.J.; John Richard Cowan, Brooklyn, and Anthony Joseph Russo, Richmond Hills, both of N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 13, 1974, Ser. No. 505,808

Int. Cl.² G10L 1/00

U.S. Cl. 179—1 SA **22 Claims**



10. A transmitter for a digital vocoder comprising:

an analog to digital converter coupled to a source of speech to provide a digital representation of said speech;

an adaptive filter coupled to said converter to derive from said digital representation of said speech a digital prediction residual and digital spectral parameters;

a pitch period extraction circuit coupled to one output of said filter responsive to said residual signal to produce a first digital signal representing the pitch period of said speech;

a voiced/unvoiced decision circuit coupled to said filter and said extraction circuit to produce a second digital excitation signal indicating when said speech is voiced and when said speech is unvoiced;

an arrangement coupled to another output of said filter to produce a digital number representing the gain of said adaptive filter; and

a multiplexing and transmitting arrangement coupled to said filter, said extraction circuit and said decision circuit to time multiplex and transmit said digital spectral parameters, said first and second digital excitation signals and said digital number.

3,975,588

ACOUSTIC FEEDBACK CONTROL

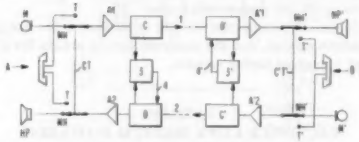
Jacques A. Besseyre, Nice; Christian A. Jacquart, Gattieres, and Jean-Louis H. Marijon, Saint Laurent du Var, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,548

Claims priority, application France, Dec. 21, 1973, 73.47136

Int. Cl.² H04M 1/20

U.S. Cl. 179—1 FS **16 Claims**



1. In an acoustic feedback control device to be installed in the extensions of a digital telephone system in which the coders and decoders each include means to determine the respective voice level and means to provide and modify a compression code quantizing step according to said respective voice level, the improvement comprising, in each extension:

a comparing means receiving the coder quantizing step and the decoder quantizing step, and

an inhibit circuit connected to said comparing means and to said decoder for preventing the decoder quantizing step from increasing when the output signal of the comparing means indicates that the coder quantizing step exceeds the decoder quantizing step.

3,975,589

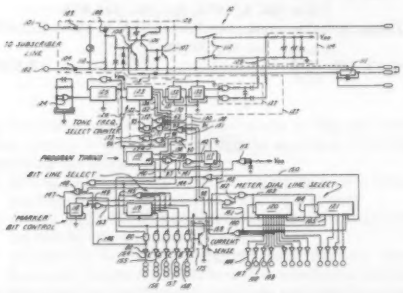
TRANSPONDER FOR TRANSMITTING DATA FROM DIGITAL ENCODING TRANSDUCERS OVER A TELEPHONE LINE

Theran L. Ebner, and Donald W. Hawkins, both of Houston, Tex., assignors to Houston Natural Gas Corporation, Houston, Tex.

Filed Apr. 7, 1975, Ser. No. 565,974

Int. Cl.² H04M 11/00

U.S. Cl. 179—2 AM **10 Claims**



1. A transponder for connection to a telephone subscriber line for transmitting data over the telephone line from one or more measuring transducers to a data collection center comprising,

an input means having means preventing interference with telephone use,

means electrically connected to the input recognizing an interrogating signal for activating the transponder,

modulator circuit means connected to the input for transmitting data by providing a plurality of different frequencies,

a frequency control circuit connected to the modulator circuit for controlling the frequency output of the modulator,

bit line strobe counter means connected to said measuring transducers and said frequency control circuit for obtaining bit line data,

dial line strobe counter means connected to the bit line strobe counter means and to the measuring transducers for obtaining data from the measuring transducers,

a program timing means connected to the modulator circuit, the frequency control circuit, the bit line strobe counter, the dial line strobe counter for controlling the timing of the transponder, and

clock means connected to the modulator, the frequency control circuit, and the program timing means for providing common timing signals.

3,975,590

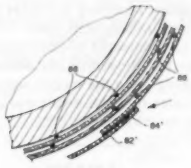
FACSIMILE COPY MEDIUM MAGAZINE

Richard L. Nelson, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 333,616, Feb. 20, 1973, Pat. No. 3,872,239. This application Dec. 16, 1974, Ser. No. 533,195

Int. Cl.² B65D *85/14*

U.S. Cl. 178—5 **6 Claims**



3. A copy medium magazine comprising a plurality of layers of copy medium each of said layers forming a substantially closed loop.

3,975,591

ELECTRONIC CAMERA

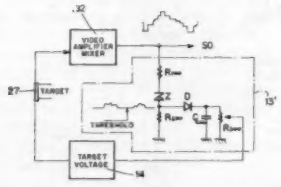
Michel Paul Papelard, Epinay-sur-Seine, France, assignor to Viteci S.A., Paris, France

Filed Feb. 8, 1974, Ser. No. 440,816

Claims priority, application France, Feb. 9, 1973, 73.04781

Int. Cl.² H04N *3/16*

U.S. Cl. 178—7.2 **8 Claims**



1. An electronic camera comprising:

a camera tube including a target electrode requiring excitation at a high voltage;

a high voltage power supply connected to said camera tube target electrode;

video amplifier means having an input connected to the target electrode of the camera tube, for developing a video output signal;

and an automatic sensitivity control comprising:

a rectifying circuit connected to an output of said video amplifier, for developing a control signal representative of the D.C. component of said video output signal, said rectifying circuit comprising a diode connected between said video amplifier output and a target control circuit means;

adjustable impedance means, connected to said rectifying circuit, for adjusting the amplitude limits of said control signal, said adjustable impedance means comprising an adjustable resistance interposed in series between said diode and said target control circuit means;

and said target control circuit means being connected to said rectifying circuit and to said high voltage power supply to vary the output level of the high voltage applied to the target electrode in accordance with variations in said control signal and thereby control the sensitivity of the camera tube in accordance with image content.

3,975,592

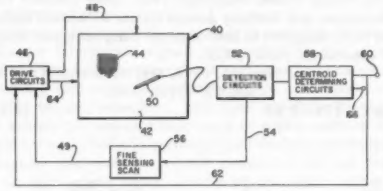
ELECTROGRAPHIC SYSTEM

Philip P. Carvey, Bedford, Mass., assignor to Applicon Incorporated, Burlington, Mass.

Filed Jan. 23, 1975, Ser. No. 543,645

Int. Cl.² G08C *21/00*; H03K *13/20*

U.S. Cl. 178—18 **10 Claims**



2. An electrographic system comprising:

a first plurality of electrical conductors and a second plurality of electrical conductors arranged so as to form a coordinate system;

means for sequentially energizing at a first rate each of the conductors of said first plurality thereof so as to provide an electric field in proximity to each energized one of said first plurality of conductors;

probe means for sensing the electric field provided by at least one of said first plurality of conductors during sequential energization thereof so as to provide a first signal responsively to the sensed field;

means responsive to said first signal for arresting said energizing at said first rate and for sequentially energizing a selected number of said first plurality of conductors, each for a preselected period of time and at a second rate, so as to provide a plurality of second signals each representative of the electrical field strength between said probe means and each of said selected members of conductors;

means for determining the time centroid of said second signals and for generating in response to the determination of said time centroid of said second signals, a third signal representative of the position of said probe means relative to said first plurality of conductors;

means responsive to said third signal for sequentially energizing at a third rate each of the said second plurality of conductors so as to provide an electric field in proximity to each energized one of said second plurality of conductors so that said probe means provides a fourth signal in response to sensed electric fields around the conductors of said second plurality in proximity to said probe means.

means responsive to said fourth signal for arresting said energizing at said third rate and for energizing a selected number of said second plurality of conductors for a second preselected period of time and at a fourth rate, so as to provide a plurality of fifth signals each representative of the electric field strength between said probe means and each of said selected number of conductors of said

second plurality during said second preselected period of time; and

means for determining the time centroid of said fifth signal and for generating in response to the determination of said time centroid of said fifth signal, a sixth signal representative of the position of said probe means relative to said second plurality of conductors.

3,975,593

TIME DIVISION MULTIPLEX SYSTEM AND METHOD FOR THE TRANSMISSION OF BINARY DATA

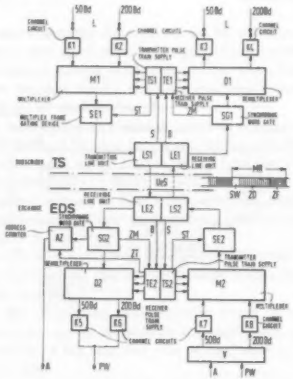
Herbert Fick, Wolfratshausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 2, 1974, Ser. No. 528,726

Claims priority, application Germany, Dec. 6, 1973, 2360943

Int. Cl.² H04J *3/04, 3/16*

U.S. Cl. 179—15 BV **5 Claims**



3. In a time division multiplex transmission system of data comprising start-stop signals with fixed transmission speeds and signal frames and also comprising start-stop signals with arbitrary transmission speeds and signal frames, the improvement comprising:

means for transmitting signals with fixed transmission speeds and signal frames under signal frame control and means for transmitting signals with arbitrary transmission speeds and signal frames in a speed-transparent manner, said transmitting means, respectively, being constructed to employ in common multiplex frame of the system.

3,975,594

APPARATUS UTILIZING A PHANTOM CIRCUIT FOR CONNECTING ADDITIONAL SUBSCRIBERS TO A TELECOMMUNICATION SYSTEM

Siegfried Guntersdorfer, Sauerlach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 316,588, Dec. 19, 1972, abandoned.

This application Feb. 10, 1975, Ser. No. 548,671

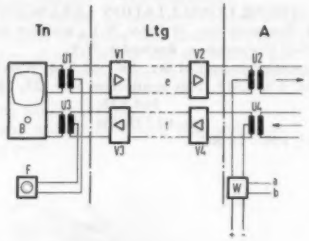
Claims priority, application Germany, Dec. 20, 1971, 2163284

Int. Cl.² H04M *7/08, 11/08*

U.S. Cl. 179—15 BB **1 Claim**

1. In telecommunication systems wherein line connections from a subscriber set to an exchange switching center are made over two balanced line pairs which additionally form a phantom circuit providing a path for a remote power source, the improvement comprising:

additional subscriber set means connected to said phantom circuit at the location of said subscriber set so that a two-way message path is formed between said additional subscriber set and said exchange switching center over said phantom circuit and a conducting path is formed between said remote power source and said additional subscriber set and



branch circuit means connected to said phantom circuit and including said remote power source, means for coupling audio signals to said phantom circuit and means for coupling control signals to said phantom circuit.

3,975,595

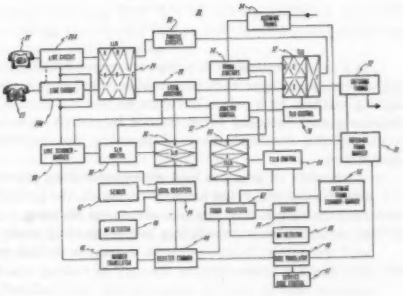
SERVICE CODE CONVERSION

James E. Berube, Shortsville, and Gunter F. Neumeier, Rochester, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,776

Int. Cl.² H04M *3/42*

U.S. Cl. 179—18 BA **10 Claims**



1. In a common control telephone system having dual translation circuits, a method for connecting special service calls comprising the steps of:

a. dialing an abbreviated service access code from a calling line into one of a plurality of common registers;

b. storing a class-of-service signal associated with said calling line in said common register;

c. transferring the access code and class-of-service signal from said common register to a first translation circuit;

d. decoding the transferred access code and class-of-service signal into a service code signal;

e. enabling a service control circuit with said service code signal;

f. translating the access code into a directory number and type of call signal in said first translation circuit under the direction of the enabled service control circuit;

g. transferring said directory number and type of call signal into storage in said common register and in a second translation circuit;

h. marking a line circuit corresponding to the directory number under the direction of the second translation circuit, and

i. connecting the calling line to the marked line circuit which corresponds to the dialed abbreviated service access code.

3,975,596

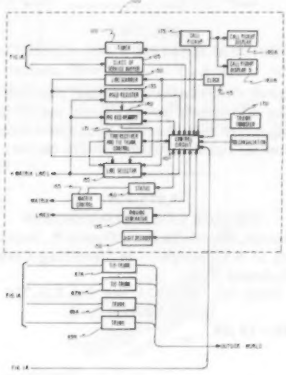
TRUNK CONSULTATION ARRANGEMENT

Uwe A. Pommerening, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 561,744, March 25, 1975, Pat. No. 3,936,615. This application Mar. 25, 1975, Ser. No. 561,825

Int. Cl.[2] H04M 3/56

U.S. Cl. 179—18 BC 6 Claims



1. In a private automatic branch exchange (PABX) employing a cross point type switching matrix which connects local calling stations to local called stations and local stations to incoming and outgoing trunk parties by matrix connections made by the instrumentality of junctors, the combination comprising:

a. a plurality of junctors and a corresponding plurality of operatively associated junctor memories, the junctors and their corresponding junctors memories forming a plurality of call circuit connecting and processing assist units, said assist units being operative to receive in their respective junctor memories the identity of calling and called stations and to receive progressively updated indicia of status states of a predetermined sequence of status states of a trunk consultation call, said assist units including local stations assist units which are employed to establish local station with local station matrix connections and trunk party assist units which are employed to establish local station with trunk party matrix connections,

b. means for forwarding the assist unit association of said first consulting station from said first trunk assist unit to a local stations assist unit and for maintaining the assist unit association between said first trunk party and said first trunk party assist unit in a holding status, said latter means being operative after an initial call circuit between a consulting local station and a first trunk party is established by their common association with a first trunk party assist unit, said latter means being responsive to a first signal which is initiated by said consulting station and to a first predetermined status state present in the junctor memory of said first trunk party assist unit,

c. means for associating the consulting station with a second trunk party assist unit and initiating the ringing of a second trunk party, and for terminating the association of the consulting station and the local stations assist unit, said latter means being responsive to a second signal which is of the dial impulse type initiated by said consulting station for dialing said second trunk party and to a second predetermined status state present in the junctor memory of said local stations assist unit, and

e. means for establishing a consultation circuit between said consulting station and said second trunk party, said latter mens being responsive to a third signal which is of the off-hook type initiated by said second trunk party and to a third predetermined status state present in the junctor memory of said second trunk party assist unit.

3,975,597

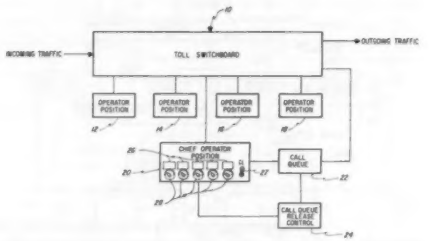
CALL QUEUE RELEASE CONTROL CIRCUIT

Siegfried Voise, Rochester; Thomas M. Wagner, East Rochester, and Walter Zeitler, Webster, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 25, 1974, Ser. No. 527,002

Int. Cl.[2] H04Q 3/64

U.S. Cl. 179—27 D 4 Claims



1. In an automatic toll switchboard having a call queue circuit for stacking different types of calls into corresponding sectional stores, a call queue release control circuit comprising:

a plurality of presettable counter circuits, each of said counter circuits being associated with a particular type of call to be stored and thereby with a particular sectional store;

input gating circuit means connected to each counter circuit for presetting each counter circuit to a representation of the designated number of calls of a certain type to be released from said call queue circuit;

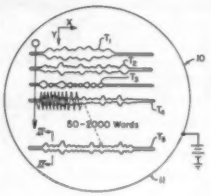
sequencing circuit means, responsive to a stepping signal for sequentially addressing individual ones of said plurality of counter circuits in a predetermined order to form an allocation chain, said sequencing means including enabling means for generating an enabling signal to enable the particular counter circuit being addressed and for directing the enablement of the sectional store of the call queue circuit associated therewith and including confirmation circuit means for receiving a confirmation signal from a sectional store that a call has been released from said sectional store, and

control gating circuit means connected to each counter circuit and responsive to a said enabling signal and a said confirmation signal for incrementing the counter circuit being addressed to a final count equal to the number of calls preset in said counter circuit and for transmitting, in response to said final count, a said stepping signal to said sequencing means, thereby effecting addressing of the next counter circuit in said allocation chain.

3,975,598
RANDOM-ACCESS SPOKEN WORD ELECTRON BEAM DIGITALLY ADDRESSABLE MEMORY

David Green, Corning, N.Y.; Harvey C. Nathanson, and Paul R. Malmberg, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1973, Ser. No. 361,107
Int. Cl.² G11B 7/02
U.S. Cl. 179—100.1 B 22 Claims



1. An apparatus for random access by an electron beam to analog data storage tracks, said apparatus comprising:
target means having a recording of a plurality of spaced-apart storage tracks defining essentially permanent recordings of analog data;
means developing an electron beam to scan along a storage track defined by said target means for producing an output electrical signal corresponding to the recordings of analog data;
first control means to direct said electron beam onto only a selected one of said storage tracks defined by the target means;
second control means to direct said electron beam along only the selected one of said storage tracks defined by the target means;
means for oscillating said electron beam at a dither frequency having an amplitude corresponding essentially to the width of the selected one of said analog data storage tracks; and
a digitally addressible control means coupled to said means for oscillating and said first and second control means to select and then scan along a storage track for producing an electrical signal corresponding to the recording of analog data, said digitally addressible control means enabling said first control means to direct said electron beam from track-to-track onto the selected one of said storage tracks, said digitally addressible control means further enabling said means for oscillating and said second control means to direct said electron beam along the storage track while the beam oscillates at the dither frequency and thereby scan the selected one of said storage tracks.

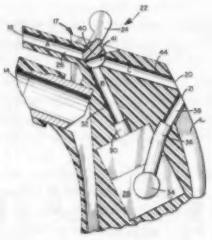
3,975,599
DIRECTIONAL/NON-DIRECTIONAL HEARING AID

Donald L. Johanson, Wayland, Mass., assignor to United States Surgical Corporation, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,069
Int. Cl.² H04R 1/20, 1/34, 25/00
U.S. Cl. 179—107 FD 8 Claims

1. A hearing aid comprising:
a differential transducer having first and second sound receiving ports;
a housing having at least one forwardly facing sound receiving aperture and at least one rearwardly facing sound receiving aperture;
a first sound receiving path between said rearward facing aperture and said second transducer port;
a second sound receiving path for selectably coupling said first receiving port to said forwardly or said rearwardly facing sound receiving apertures and including:
control valve means operative in a first position to couple sound energy received by said forwardly facing aperture to said first sound receiving port, and in a second position to couple sound energy received by said rearwardly facing aperture to said first sound receiving port;
electronic circuitry for amplifying and processing sound information received by said transducer;
electrical switch means for adjusting the gain of said electronic circuitry to provide substantially the same gain for both modes of operation of said transducer; and
an earpiece coupled to said circuitry and adapted to the ear of a user.

6. A hearing aid comprising;
a differential transducer having first and second sound receiving ports;



a housing having at least one first facing sound receiving aperture facing in one direction and at least one second sound receiving aperture facing in an opposite direction;
a sound receiving path between said second aperture and said second transducer port;
a sound receiving path for selectably coupling said first receiving port to said first or said second sound receiving apertures and including:
control valve means operative in a first
position to couple sound energy received by said first facing aperture to said first sound receiving port, and in a second position to couple sound energy received by said second facing aperture to said first sound receiving port;
electronic circuitry for amplifying and processing sound information received by said transducer;
electrical switch means integral with said valve means for adjusting the gain of said electronic circuitry to provide substantially the same gain for both modes of operation of said transducer; and
an earpiece coupled to said circuitry and adapted to the ear of a user.

7. A hearing aid comprising:
a differential transducer having first and second sound receiving ports;
a housing having at least one forwardly facing sound receiving aperture and at least two rearwardly facing sound receiving apertures;
a first sound receiving path between a second of said at least two rearwardly facing apertures and said second transducer port;
a second sound receiving path for selectably coupling said first receiving port to said forwardly or to a first of said at least two rearwardly facing sound receiving apertures including a first passage between said first rearwardly facing aperture and said valve means and a second passage between said forwardly facing aperture and said valve means and a third passage between said valve means and said first transducer port;
said valve means being operative in its first position to provide a sound receiving path through said first and third passages and operative in its second position to provide a sound receiving path through said second and third passages;

the combined acoustic impedance of said first and third passages substantially matching that of said second and third passages;

electronic circuitry for amplifying and processing sound information received by said transducer; and

an earpiece coupled to said circuitry and adapted to the ear of a user.

3,975,600

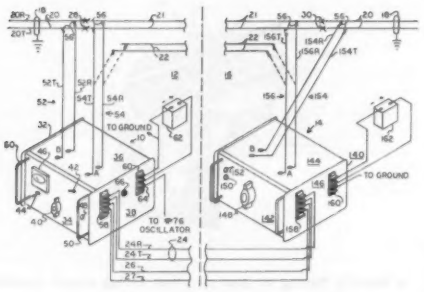
TELEPHONE LINE SPLICING APPARATUS

Harvey J. Marston, 1532 Alturas Drive, Burlingame, Calif. 94010

Filed June 6, 1975, Ser. No. 584,693

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 A **11 Claims**



1. Apparatus enabling locating, cutting and splicing of an active circuit communications pair extending between two locations comprising is combination:

a master unit at one of the locations having external connecting wires to said pair to be spliced and to an alternate pair extending between the locations;

a remote unit at the other of the locations having external connecting wires to said pair to be spliced onto said alternate pair;

connection verification means in said master unit and said remote unit for verifying a correct interconnection of said remote unit to said master unit via said pair to be spliced without interference to said active circuit on said pair to be spliced;

switching means in said master unit for switching said active circuit to said alternate pair at said first location, and for transmitting a switching signal to said remote unit;

automatic switching means in said remote unit for switching said active circuit to said alternate pair at said other location in response to said switching signal;

guard circuit means automatically responsive to said interconnection verification means for overriding said switching means and said automatic switching means if verification of said interconnection between said master unit and said remote unit ceases upon actuation of said switching means.

3,975,601

ROTARY SWITCH ACTUATABLE TO GENERATE PULSES IN A SELECTED ONE OF TWO NODES

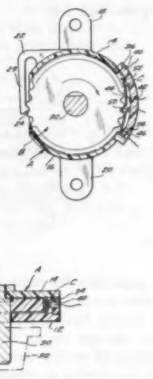
Robert D. Whelan, West Springfield, Mass., assignor to General Instrument Corporation, Clifton, N.J.

Filed June 11, 1975, Ser. No. 586,079

Int. Cl.² H01H *19/60, 21/80, 3/42*

U.S. Cl. 200—11 R **26 Claims**

1. A pulse generator comprising a housing having first and second spaced terminals mounted thereon, a conductive element mounted for limited movement in a first sense relative to said housing between a first position wherein said element is operatively connected to said first terminal and a second position wherein said element is operatively connected to said second terminal, a member having a hill-and-valley surface mounted on said housing for movement in a first and a second direction, means operatively connected to said element engagable with said surface to move said element between said first and said second position when said member is moved a given



distance in said first and said second direction, respectively, a third terminal mounted on said housing at a position spaced from said element at both positions of said element, said means being effective, upon movement of said member beyond said given distance in the same direction, to move said element in a second sense, in accordance with the undulations of said surface, to intermittently contact said third terminal.

3,975,602

ARC QUENCHING ARRANGEMENT FOR A GAS FLOW CIRCUIT BREAKER

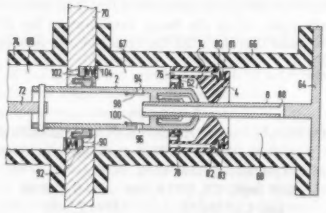
Walter Hertz, Erlangen-Buchkenhof, and Jan Stroh, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 13, 1975, Ser. No. 549,776

Claims priority, application Germany, Mar. 12, 1974, 2411897

Int. Cl.² H01H *33/88*

U.S. Cl. 200—148 A **9 Claims**

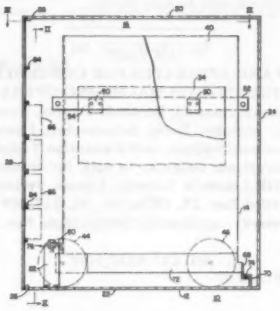


1. An arrangement for quenching an arc in a gas flow circuit breaker such as a blasting piston circuit breaker in which a flow canal with a check valve is provided, the flow channel leading through an insulating part to a quenching gap, with quenching gas flowing from a high pressure chamber to a low pressure chamber across the quenching gap, wherein the improvement comprises an overflow channel establishing a path from the high pressure chamber to the low pressure chamber which parallels the path between these two chambers across the quenching gap, and a pressure relief valve in said overflow channel.

3,975,603
EARTHQUAKE RESISTANT SWITCHGEAR

Willard S. Albert, Trafford, and August P. Colaiaco, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 2, 1975, Ser. No. 538,064
Int. Cl.² H01H *3/60*
U.S. Cl. 200—301 **9 Claims**

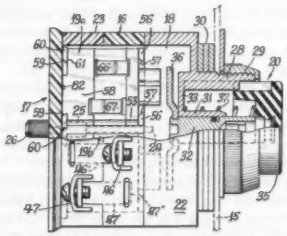


1. Metal-enclosed switchgear for decreasing resonance vibrations comprising an enclosure including a rear wall, opposite side walls, a bottom wall, and an access opening, a door for the access opening, the door comprising spaced stiffener means to increase the vibration frequency of the door sections between said means in response to and at a frequency greater than that of seismic vibrations, a circuit breaker removably disposed within the enclosure, stabilizing means for preventing relative motion between adjacent components of the enclosure and the circuit breaker in response to ambient vibratory forces, the circuit breaker comprising at least one arc chute and an insulating barrier wall on each side of the arc chute spaced from the arc chute, and said means comprising first spacers of electrically insulating material between the arc chute and each barrier wall.

3,975,604
MODULAR ELECTRICAL SWITCH WITH SPLIT HOUSING

Arthur I. Appleton, 1 Bridlewood Road, Northbrook, Ill. 60062

Filed Dec. 9, 1974, Ser. No. 531,084
Int. Cl.² H01H *9/08*
U.S. Cl. 200—303 **10 Claims**



1. A multiple switch assembly for attachment to electrical wires and including:

a main body comprising a fixed component and a removable component, said fixed component including a front wall and side walls integral with the front wall which walls, with said removable component, define an enclosed space, said removable component having an inner rear wall at the rear of said enclosed space;

a plurality of wiring connectors mounted on the exterior of said side walls and each being adapted to be connected to a respective one of said wires, a corresponding plurality of first electrical contacts mounted on the interior of said side walls and immediately adjacent thereto so that said space is substantially unobstructed thereby, means electrically connecting each contact with a respective connector;

a plurality of switch devices positioned in a predetermined orientation in said space, each device comprising a body, at least two second electrical contacts on the exterior of the device body, switch means in the device body to make and break an electrical connection between the second electrical contacts, and switch actuating means for operating said switch means, said device body having side walls adjacent side walls of the main body, and front and rear ends oriented toward the front and rear walls respectively of the main body, said second electrical contacts being on at least one of the device body walls and in engagement with respective first electrical contacts, said actuating means being at the device front end, means releasably securing said device rear end to said body rear wall; and

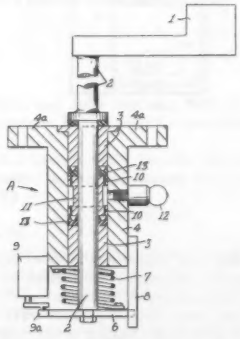
a control actuator extending through said main body front wall and movable with respect thereto, said actuator having a first portion on the exterior of the body front wall for use in moving the actuator and a second portion in said space, means between said second portion and said switch actuating means for moving the latter in response to movement of the second portion;

whereby a defective device may be removed for replacement or servicing, without the necessity of detaching the wires from the connectors, by detaching said removable component from said fixed component and withdrawing said devices from the space as the removable component is moved away from the fixed component.

3,975,605
PARTICULATE MATERIAL SUPPLY DETECTORS

Stephanus Jacobus Daniël van Eeden, and Jacobus Francois Pienaar, both of Sasolburg, Orange Free State, South Africa, assignors to South African Coal, Oil & Gas Corporation Limited, Sasolburg, Orange Free State, South Africa

Filed May 19, 1975, Ser. No. 578,892
Claims priority, application South Africa, May 20, 1974, 74/3203
Int. Cl.² H01H *35/00*
U.S. Cl. 200—61.21 **9 Claims**



1. A hopper for particulate material including means for detecting when a supply of particulate material in the hopper falls below a predetermined minimum level, the detecting

means comprising a sleeve located outside the hopper and secured with its one end against the outside of the hopper; a spindle located axially in the sleeve and rotatably mounted in the sleeve for rotation about its own axis relative to the sleeve; a first end of the spindle projecting into the hopper from the end of the sleeve located against the hopper; a sensor element in the form of a vane fast with and extending transversely in one direction only from the first end of the spindle, the sensor element being rotatable with the spindle about the axis of the spindle between a starting position and a displaced position; means resiliently biasing the sensor element towards the starting position, the sensor element being rotatable with the spindle against the action of the biasing means from the starting position towards the displaced position by movement of material in the hopper past the sensor; a second end of the spindle projecting from the opposite end of the sleeve; a cam mounted on the second end of the spindle for rotation with the spindle; electrical switch means which is operable under the influence of the cam when the sensor element is rotated to the displaced position by movement of material past the sensor and then allowed to be biased back towards the starting position when all the material has moved past the sensor; and pressure sealing means within the sleeve between the sleeve and the spindle.

3,975,606

MICROWAVE OVEN WITH UNIFORM ELECTRIC FIELD DISTRIBUTION

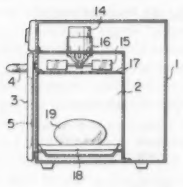
Junzo Tanaka, Fujiidera; Haruo Matsushima, and Toyotsugu Hatagawa, both of Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 16, 1974, Ser. No. 533,077

Claims priority, application Japan, Dec. 18, 1973, 48-142863; Dec. 18, 1973, 48-142864; Dec. 18, 1973, 48-142865

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 F **7 Claims**



1. A microwave oven comprising an oven body, a heating cavity of generally rectangular parallelepiped structure, a door mounted at an opening of the heating cavity to close and open said opening, and a high frequency wave oscillator for supplying microwaves to the heating cavity, said heating cavity being arranged such that the microwaves are supplied thereto at the position which is substantially laterally and longitudinally symmetrical in the heating cavity, said heating cavity being dimensioned to meet the relation;

$$\left(\frac{m}{a}\right)^2+\left(\frac{n}{b}\right)^2=\left(\frac{2f}{Co}\right)^2$$

so as to establish an electric field mode m, n, O, where a is the width of the heating cavity, b is the depth thereof, m is the wave number in the direction of the width, n is the wave number in the direction of the depth, and m and n are odd, Co is the velocity of light and f is the oscillation frequency of the oscillator, a uniform electric filed distribution thereby being established within said heating cavity.

3,975,607

METHOD AND APPARATUS FOR CONTROLLING AN ELECTROEROSION MACHINING OPERATION

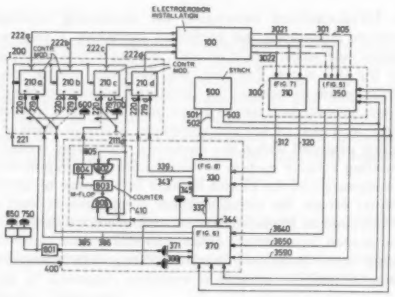
Werner Ullmann, Locarno; Bernardo Ferroni, Ascona; Renato Derighetti, Muralto; Bernd Schumacher, Losone; Silvano Mattei, Locarno-Solduno, and Costantino Tadini, Locarno, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Nov. 27, 1974, Ser. No. 527,889

Claims priority, application Switzerland, Nov. 16, 1972, 16663/72

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 M **32 Claims**



1. A method of optimizing conditions of operation, during operation, of an electroerosion machining apparatus having tool and workpiece electrodes, means for setting primary operating parameters including a desired electrode gap spacing and means for adjustment during operation of at least two of the following secondary operating parameters: (a) the rate of flow of a flushing medium in the electrode gap, (b) the interval between successive electric discharge pulses and (c) a combination of electric discharge pulse amplitude and a second characteristic of the sequence of electric discharge pulses which affects the electric power dissipation in the electrode gap, said method comprising the steps of:

generating a first gap condition index signal representative of erosion process stability and a second gap condition index signal representative of potential necessary for gap breakdown, both in response to a change in a first one of said secondary operating parameters;

producing additional changes of said first secondary operating parameter in response to resulting values of said condition index signals in the sense observed to be appropriate to maximize process stability by bringing said first condition index signal to an extreme value while maintaining second condition index variable between predetermined limit values;

repeating the previous two steps with changes of a second one of said secondary operating parameter instead of changes of said first secondary operating parameter, and

repeating the complete sequence of the foregoing steps from time to time during operation of said apparatus.

3,975,608

METHOD AND APPARATUS FOR REGULATING THE GAP DISTANCE IN ELECTRO-EROSION MACHINING

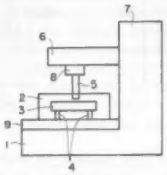
Werner Ullmann, Locarno; Bernd Schumacher, Losone; Robert Farinelli, Losone; Arnold Zimmerman, Losone; Paul Fricker, Losone, all of Switzerland, and Michel Durin, Paris, France, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Continuation of Ser. No. 301,014, Oct. 26, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,432

Claims priority, application Switzerland, Apr. 6, 1972, 5070/72

Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 NN **12 Claims**



1. A method of uniformly distributing the electro-erosion effect of a tool electrode on a workpiece in at least the finishing stage of electroerosion machining, using the same tool electrode used for the roughing stage, said tool electrode being controlled as to relative approach of said electrode and said workpiece by a working-gap regulation system for avoidance of short circuits and provision of a relatively high rate of removal of material, comprising the steps of:

advancing a tool electrode (5) into a workpiece (3) mounted on a movable carrier under control of said working gap regulation system;

subjecting said carrier, at least after the advancement of said tool electrode into said workpiece is completed, to a circular displacement motion perpendicular to the direction of said advancement, which motion is such as not to rotate said carrier in its orientation about the axis of said circular motion, and

varying the radius of said circular displacement motion while said motion is going on in a manner subject to control by the same working-gap regulation system used to control relative approach of said tool and workpiece during said roughing stage for avoidance of short circuits and provision of a relatively high rate of removal of material.

3. Apparatus for electro-erosion machining of a workpiece with an electrode tool having means for uniform distribution of erosion effect over the machined surface for fine machining while using the same electrode tool used for coarse machining, said apparatus comprising:

a carrier (11) for said workpiece movably mounted on a plurality of bearings (137) in each of which is rotatably mounted a first member (123) of an eccentric pivot which has a second member (103) rotatable in a bearing (131) fixed on a work table member (9);

first drive means (110, 111, 112) for rotating the said second members (103, 104) of each of said eccentric pivots;

second drive means (115, 116, 117) for rotating the first members (121) of each of said eccentric pivots, and

control means (118, 119, 120, 152-157) for producing rotation of said first members (121) of each of said eccentric pivots relative to the corresponding respective second members (103, 104) of said eccentric pivots without interrupting the operation of said first and second drive means, said first and second drive means being provided with means (105, 106, 101, 108, 113, 109, 114) for their operation in synchronism with each other except during operation of said control means,

said eccentric pivots being so formed that, for one position of the first and second members thereof relative to each other, the synchronous operation of said first and second drive means produces substantially no motion of said carrier, whereas for other positions thereof said carrier is subjected to a circling motion, the radius of which is continuously controllable by said control means.

3,975,609

VACUUM DELAY VALVE

Frank J. Martin, and Rex R. Holbrook, both of Ann Arbor, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 311,090, Dec. 1, 1972, Pat. No. 3,857,373. This application May 10, 1974, Ser. No. 468,851

Int. Cl.[2] B73K *9/16*

U.S. Cl. 219—69 M **3 Claims**

1. A method of fabricating an orifice time delay valve member which divides a valve chamber into two chambers wherein the rate of fluid communication between the chambers is controlled by the diameter and length of the orifice in the time delay valve, the method comprising the steps of:

forming a plate member of a predetermined thickness for structural rigidity and of a shape to conform to the configuration of the valve chambers,

coining an area of said plate member to a thickness which is less than said predetermined thickness and corresponds to the desired length of the control orifice in the orifice time delay valve,

and thereafter boring said coined area to provide an orifice therein of a predetermined size.

3,975,610

WELDING

Trevor Bagshaw, and John McCann, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Sept. 9, 1974, Ser. No. 503,940

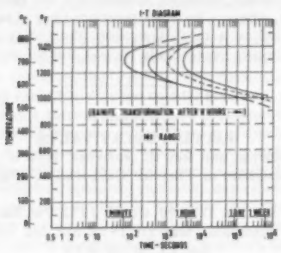
Claims priority, application United Kingdom, Sept. 17, 1973, 43447/73

Int. Cl.[2] B23K *9/04*

U.S. Cl. 219—76 **3 Claims**

1. A method of applying a hard facing to an iron or steel former comprising melting a consumable electrode and a flux on to the former by a submerged arc welding process and moving the former and the welding head relative to one another to deposit a bead of heat treatable low alloy steel weld on the former, the consumable electrode and the flux being chosen to give a said deposited weld metal comprising, by weight, from 0.18% to 0.25% carbon, 0.6% to 1.0% silicon, 1.25% to 2.0% manganese, from 4.0% to 6.0% chromium,

0.5% to 1.0% molybdenum, the balance being iron and impurities, the manganese and silicon being chosen in ratio of



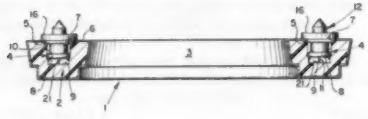
approximately 2 : 1 and sufficient manganese being present to balance the sulphur content.

3,975,611

TRIM FASTENING

Stanley H. Gordon, Winchester, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 1, 1969, Ser. No. 881,044
Int. Cl.² B23K *11/04*
U.S. Cl. 219—98 **39 Claims**



1. An assembly comprising the combination of a trim member having a primarily electrically nonconductive body structure and having a metallic surface capable of conducting a high-amperage electric current and a nonintegral welding stud seated in said body structure of said member and in electric current carrying contact with said metallic surface of said member, said welding stud embodying means adapted to make effective electric current carrying contact with a metallic supporting structure when said stud is pressed against such a structure, whereby current from an electrode placed in contact with said surface of said trim member will flow from said member to said welding stud and to a supporting structure so that an electrical welding of said trim member to the structure may be effected, absent any appreciable change in the external configuration of said trim member incident to the welding operation.

3,975,612

WELDING METHOD FOR DISSIMILAR METALS

Takamitsu Nakazaki, Takahagi; Hisanao Kita, Hitachi; Tatsuo Yonezawa, Hitachi; Yasuzi Kawada, Hitachi, and Hisanori Okamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 14, 1974, Ser. No. 479,506
Claims priority, application Japan, June 18, 1973, 48-67777
Int. Cl.² B23K *15/00*
U.S. Cl. 219—121 EM **8 Claims**

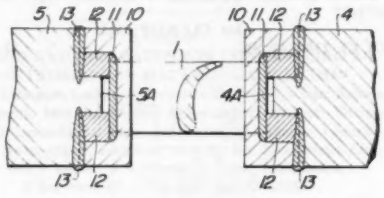
1. A welding method for joining two dissimilar metal members comprising the steps of:

a. forming a first joint surface on a first metal member,

b. preparing a metal plate having a hole therethrough, said metal plate being substantially the same material as said first metal member,

c. fitting an end portion of a second metal member into said hole of the metal plate, said second metal member being a different material than said first metal member,

d. depositing a layer of at least one filler material in said hole for rigidly connecting said end portion of said second metal member to said metal plate and for providing a build-up layer of said deposited filler material extending through said hole from the connection with said end portion, said filler material being substantially the same material as said first metal member,



e. forming a second joint surface on said metal plate and said build-up layer by machining at least one of said build-up layer and said metal plate to form substantially coplanar surfaces of said build-up layer and metal plate, said coplanar surfaces forming said second joint surface,

f. positioning said first and second joint surfaces in contacting relation, and

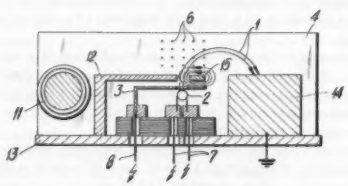
g. applying electron beam welding along the interface between said first and second joint surfaces of substantially the same material, thereby joining said first and second metal members to each other through said metal plate and said build-up layer of deposited filler material.

3,975,613

ELECTRON BEAM-GENERATING SYSTEM

Gunther Wulff, Trubbach, Switzerland, and Josef Vogt, Balzers Furstentum, Liechtenstein, assignors to Balzers Patent und Beteiligungs AG, Liechtenstein

Continuation of Ser. No. 353,400, April 23, 1973, abandoned.
This application Sept. 6, 1974, Ser. No. 503,697
Claims priority, application Switzerland, Apr. 26, 1972, 6249/72
Int. Cl.² B23K *15/00*
U.S. Cl. 219—121 EB **8 Claims**



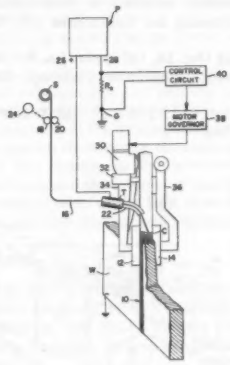
1. In an electron beam-generating system including an electoron-emitting cathode, a beam focusing electrode, a further electrode constituting an anode for accelerating the emitted electrons, means for producing a first magnetic field extending transversely of the beam to deflect the beam, along a curved path in a plane perpendicular to the magnetic field, to a focal spot on material to be heated, and means for effecting periodic deflection of the focal spot of the beam on the material, the improvement comprising, in combination, a single magnet having opposite polarity pole pieces extending, in the direction of the curved path of the electron beam, in spaced parallel relation on opposite sides of the electron beam, and constituting said means producing said transversely extending mag-

netic field for deflecting the beam along a curved path to a focal spot on material to be heated; a large cross-sectional area, low impedance, rectilinear high current carrying conductor of non-magnetic material extending perpendicular to the plane of deflection of the electron beam across the electron beam in close proximity to the curved path of the deflected electron beam and closely adjacent the concave side of the curved path of the deflected electron beam, said high current carrying conductor constituting said means for periodic deflection of the focal spot of the beam on the material and, responsive to a current-flow therethrough, producing therearound a second electric field in which the lines of force intersect perpendicularly the lines of force of said first magnetic field and extend parallel to said plane; and current supply lines connected to said conductor to supply a high density, low voltage, high frequency electric current to flow therethrough to produce the electric field surrounding said high current-carrying conductor and which alternates in direction, whereby said focal spot is deflected alternately in opposite directions which are transverse to said plane; said current supply lines being so located, relative to the electron beam, that their electric fields have no marked influence on the electron beam.

3,975,614
ELECTROSLAG WELDING SPEED CONTROL

Tibor Endre Toth, and Steven Finn Hardwick, both of Florence, S.C., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,843
Int. Cl.² B23K *25/00*
U.S. Cl. 219—126 **3 Claims**

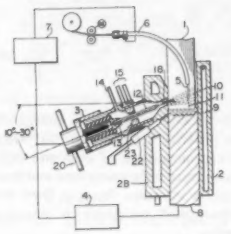


1. In a system for welding workpieces in a substantially vertical direction comprising, a pair of molding shoes slidably engaging said workpieces along a gap formed between the workpieces to be welded, said molding shoes surrounding said gap for forming a cavity of predetermined geometry; means for advancing a consumable electrode into said cavity at a predetermined speed, means for passing a current through said electrode for forming a molten weld puddle within said cavity, and driving means for moving said molding shoes vertically upwards along said gap, the improvement of which comprises; control means which produce a direct current signal for varying the speed of said driving means in response to variations in the magnitude of said electrode current, said control means comprising: means for providing a direct current output in response to the magnitude of said electrode current; oscillator means for generating an oscillating alternating output signal at a predetermined frequency, said oscillator means being connected to said direct current output such that the magnitude of said alternating output signal is modulated by said direct current output; transducer means for providing a varying output response to said modulated alternating output signal; and means for converting said varying output to said direct current signal the magnitude of which varies in proportion to said direct current output.

3,975,615
VERTICAL POSITION WELDING METHOD AND APPARATUS FOR PRACTICING THE METHOD

Shinichi Konishi, Kawagoe, Japan, assignor to Denyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1975, Ser. No. 605,820
Claims priority, application Japan, Aug. 22, 1974, 49-95548
Int. Cl.² B23K *9/12*
U.S. Cl. 219—126 **9 Claims**



1. A vertical position welding method for butt-welding metal plates which comprises:

a. positioning metal plates to be welded to form a relatively narrow groove with the edges of said metal plates;

b. placing front and rear holding members, each made of copper and being of the water cooling type, on the front surface and the rear surface of said metal plates thus positioned so as to define a welding space in said groove and to maintain molten weld metal in said groove;

c. providing a non consumable electrode torch outside said groove for producing a plasma arc to melt the edges of said metal plates;

d. continuously feeding a consumable electrode into said welding space;

e. generating an arc between said consumable electrode and said non-consumable electrode torch to melt said consumable electrode;

f. generating a plasma arc between said non-consumable electrode torch and said metal plates to be butt-welded; and

g. applying said plasma arc to said metal plates in said welding space to the entire thickness thereof, thereby accomplishing a desired weld while melting said edges of said metal plates.

3,975,616
CONTROL CIRCUIT FOR AUTOMATIC ELECTRIC ARC-WELDER

Richard Philip Siktberg, Richmond Heights, and Marvin Lee Schiedermayer, Euclid, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Nov. 13, 1974, Ser. No. 523,462
Int. Cl.² B23K *9/12*
U.S. Cl. 219—131 F **5 Claims**

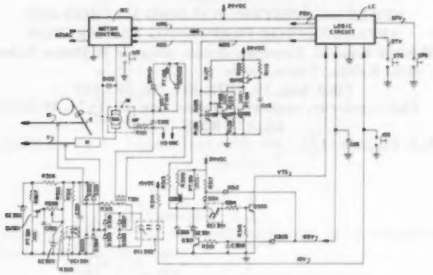
1. An automatic electric arc welder comprising in combination:

a. an electric motor having a field and armature for moving an arc welding electrode towards and away from a workpiece,

b. means for energizing said armature with a unidirectional voltage when it is desired that said armature rotate,

c. means for continuously energizing said field with a reversible polarity voltage whereby said armature when energized will rotate in either an electrode retract or electrode feed direction,

d. braking means consisting of a diode connected directly in parallel with said armature of a polarity as to be 'off'



whenever said armature is energized with said unidirectional polarity voltage and 'on' whenever said armature generates a voltage of opposite polarity whereby when said armature is de-energized and the polarity of said field voltage is reversed from a feed direction to a retract direction said armature is automatically dynamically braked.

3,975,617

PIPE HEATING BY AC IN STEEL

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 107,351, Jan. 18, 1971, Pat. No. 3,777,117. This application Aug. 30, 1973, Ser. No. 393,043

Int. Cl.² H05B *3/00*; **F16L** *53/00*

U.S. Cl. 219—300 **20 Claims**

1. A heat generating system comprising:

a. an elongated shape made of metal having magnetic properties and electrical conductivity and having a first, near, end and a second, remote, end;

b. means whereby a utilitarian fluid is caused to flow in direct contact with a surface of said elongated shape;

c. an elongated electrical conductor means, positioned in closely adjacent but electrically insulated relationship with respect to an exterior surface of said shape throughout their respective lengths, said conductor means having a first, near, end adjacent said first end of said elongated shape and a second, remote, end adjacent said remote end of said elongated shape; said insulated conductor means being uncovered throughout those portions of its outer surface not directly confronting said shape by any electrically conductive material which would shield the electromagnetic field generated around said conductor means in a direction away from said shape;

d. a source of AC having a first supply terminal and a second supply terminal;

e. an electrical connection directly between said first AC terminal and said first, near, end of said elongated shape;

f. an electrical connection between said second AC terminal and said first, near, end of said electrical conductor means;

g. an electrical connection between said second, remote, end of said elongated shape and said second remote, end of said electrical conductor means;

h. an AC circuit established:

i. from said second terminal of said AC source through the substantial length of said electrical conductor means,

ii. then back through said substantial part of the length of said elongated shape adjacent to said electrical conductor means so as to produce a skin effect current concentrated in a longitudinal band of that part of the skin of said elongated shape which is adjacent to said electrical conductor means, said elongated shape having at least twice the thickness of said skin, said skin effect current thus producing heat in said elongated shape; and

iii. finally back to said first AC terminal, to complete said AC circuit, whereby

i. at least some part of said heat produced in said elongated shape is transferred directly to said utilitarian fluid without passing through any other material.

3,975,618

METHOD AND APPARATUS FOR HEATING SYNTHETIC PLASTIC COMPONENTS

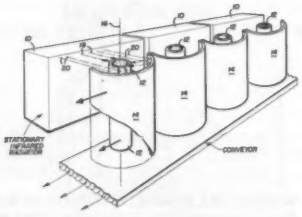
Heinz Goos, Schenefeld, and Peter Rose, Henstedt-Ulzburg, both of Germany, assignors to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Hamburg, Germany

Filed Oct. 24, 1974, Ser. No. 517,442

Claims priority, application Germany, Feb. 14, 1974, 2406955

Int. Cl.² F27B *9/06*; **H05B** *1/00*

U.S. Cl. 219—388 **6 Claims**



1. In an apparatus for heating a thermoplastic component preparatory to forming the component to a different shape, an elongated infra-red radiator assembly, a concave reflector facing said radiator assembly in spaced relation thereto and having a focal location spaced from the radiator assembly at which infra-red radiation from said radiator assembly is focused, means for supporting the component intermediate the radiator assembly and the reflector and at the focal location of the reflector, and means for jointly displacing the the component support means and the reflector in a path along the length of the radiator assembly, while maintaining the component in fixed relationship to said focal location.

3,975,619
ILLUMINATED ELECTRIC CIGAR LIGHTER

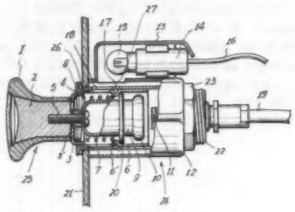
Toshio Uda, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan

Filed June 16, 1975, Ser. No. 587,113

Claims priority, application Japan, Mar. 17, 1975, 50-34645

Int. Cl.[2] E23Q *7/22*

U.S. Cl. 219—269 **1 Claim**



1. In a cigar lighter,

a holding device comprising a tubular shell having an igniting unit opening in its front portion; an electric igniting unit having an outer shell being mounted in said tubular shell;

means including a tubular sleeve surrounding the shell, for mounting the latter on a panel through an aperture thereof, said sleeve, tubular shell and outer shell having registering side wall openings to admit light from outside the sleeve into the interior of the tubular shell and the outer shell of the igniting unit;

a lamp housing being mounted on the sleeve over a side wall opening thereof;

an electric lamp in said housing for producing light to pass through said wall openings and into the interiors of the shell and the igniting unit; and

a knob being mounted on the igniting unit and having a core of light transparent illuminating material, said knob having at least one opening at the mounted end thereof between said core and the interior of said igniting unit to permit the transmission of the light from the interior of said igniting unit and through said transparent core.

3,975,620
CONTROL SYSTEM FOR CHARGING AND DISCHARGING AN ELECTRIC STORAGE HEATER

Knud Julius Hallgreen, and Poul Christian Carlos Iversen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

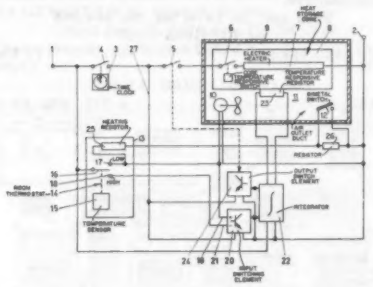
Filed Jan. 2, 1975, Ser. No. 537,925

Claims priority, application Germany, Jan. 15, 1974, 2401659

Int. Cl.[2] H05B *1/02;* **F24H** *7/04;* **F24D** *11/00*

U.S. Cl. 219—364 **4 Claims**

1. An electric storage heater assembly comprising a main circuit having in series heating element means, a clock controlled time switch and a main charging switch, heat storage means in heat exchange relationship with said heating element and fan means for conveying heat away from said heat storage means, room thermostat means having a neutral position along with low and high temperature position terminals, said fan means being connected to said thermostat low temperature position terminal for operation when said room thermostat is in the low temperature position, an electric integrator, input and output switching means alternately connected to said integrator through said time switch, said input switching means being operative only when said time switch is open and said output switching means being operative only when said time switch is closed, said input switching means having positive and negative terminals with said positive terminal being electrically connected in circuit with said fan means and to said low temperature position thermostat terminals, said negative terminal being electrically connected to said high temperature position thermostat terminal, said main charging switch being connected to and closed by said output switching means for a period of time in accordance with the output signal of said integrator.



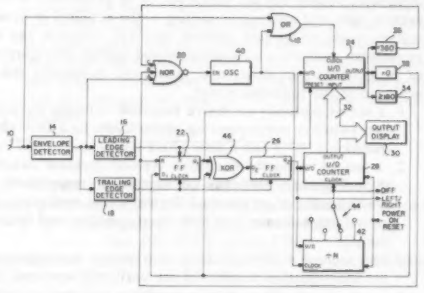
3,975,621
DIGITAL COMPASS AVERAGING CIRCUIT

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Feb. 24, 1975, Ser. No. 552,049

Int. Cl.[2] G06F *15/50*

U.S. Cl. 235—150.26 **11 Claims**



1. A signal averaging circuit comprising:

means for receiving digital signals representing successive angular positions and for providing signal indications thereof;

first means operative in response to a previously received digital signal for storing a representation of an average value thereof;

second means operative to store said representation from said first storing means and thence operative in response to a presently received digital signal to effectively subtract the value of said present digital signal from the value of said previous digital signal;

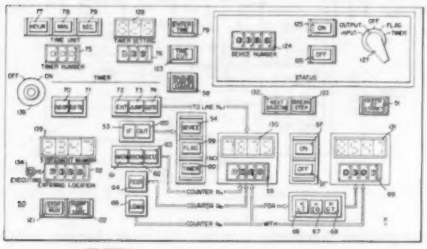
third means operative in response to the resultant of said subtraction to provide an output signal indication of the magnitude of the difference between the values of said previous and present digital signals and an output signal indication of the direction of said difference with respect to the previous angular position; and

fourth means operative in response to the resultant of said subtraction to provide an output indication of an averaged value of said previous and present digital signals and of the corresponding average angular position.

3,975,622
PROGRAMMABLE LOGIC CONTROLLER SYSTEM

Robert Horn, Richardson, and Raymond J. Slovacek, Dallas, both of Tex., assignors to Forney Engineering Company, Carrollton, Tex.

Filed Apr. 26, 1974, Ser. No. 464,388
Int. Cl.² G05B *11/00*
U.S. Cl. 235—151.1 **11 Claims**



1. A programmer panel of the type comprising a plurality of manual programming switches, first numerical designator means for manually registering a selected number to establish the address for one whole instruction, second numerical designator means for manually registering a selected number to identify an operand which is the subject of a given instruction, and output means responsive to selective manual actuation of said programming switches for producing an electrical logic level output indicative of the instruction and operand numbers designated respectively by said first and second numerical designator means and the operation to be performed in connection with said operand according to the actuated or nonactuated condition of said manual switches, wherein the improvement comprises an organizational spatial configuration of programming switches and numerical designator means arranged in the following order:

1. a set of mutually exclusive function switches including two switches corresponding respectively to a flow chart question ("IF") and a flow chart command ("OUT");
2. a set of mutually exclusive type-of-operand switches including three switches corresponding respectively to the selection of an external device, a flag indicative of a stored prior answer to a flow chart question and internal timing;
3. the second numerical designator means for registering the identification number of the particular operand; and
4. a set of mutually exclusive condition switches including two switches corresponding respectively to the conditions "ON and OFF";

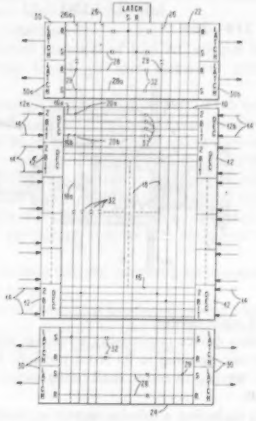
said output means producing an output representing (1) a function according to said function switches, (2) the type of operand designated by said type-of-operand switches, (3) the specific operand identified by the second numerical designator means and (4) the condition for which the operand is to be tested, or in which the operand is to be left, according to the condition switches.

3,975,623
LOGIC ARRAY WITH MULTIPLE READOUT TABLES

Arnold Weinberger, Poughkeepsie, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,217
Int. Cl.² H03K *19/20*
U.S. Cl. 235—152 **6 Claims**

1. In a programmable logic array chip having a search table of intersecting input and output lines with logic elements coupling input lines to output lines at these intersections for receiving interrogation signals on said input lines from a plurality of decoders and a readout table with intersecting input and output lines having logic elements coupling input lines to output lines at there intersections and which has the input lines coupled to the output lines of the search table to receive the output signals from the search table in response to the interrogations and which in turn supplies output signals responsive to the interrogation signals, the improvement comprising:



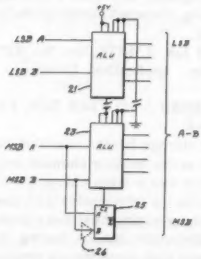
said readout table divided into two portions with input lines of one portion of the readout table receiving output signals from one end of output lines of the search table and with input lines of the other portion of the readout table receiving outputs from the other end of the output lines of the search table; and

segmented output lines in the search table so that the output signals fed from opposite ends of the segmented lines are not mixed on the segmented lines.

3,975,624
TWO'S COMPLEMENT SUBTRACTING SYSTEM

Darrell R. Kay, Bellevue, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1975, Ser. No. 578,836
Int. Cl.² G06F *7/385*
U.S. Cl. 235—175 **2 Claims**



1. A two's complement system for subtracting a subtrahend from a minuend comprising:

a. a series of interconnected four bit full adders each having a minuend input and a subtrahend input with the first of the series corresponding to the least significant bits of the minuend and the subtrahend and the last of the series corresponding to the most significant bits of the minuend and the subtrahend; and

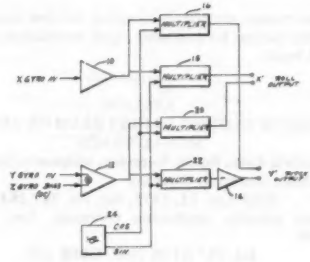
b. a one bit full adder forming an additional stage in the series of four bit full adders, fed by the sign bits of the minuend and the subtrahend and the carry output of the four bit full adder corresponding to the most significant bit for forming a sign bit with the one bit full adder having an internal inverter for the sum output.

3,975,625

ELECTRONIC COORDINATE TRANSFORMATION USING MULTIPLIER CIRCUITS

Barry N. Levitt, Framingham; Thomas H. Crocker, Burlington, and Everett E. Chapman, Ipswich, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1975, Ser. No. 541,485
Int. Cl.² G06G 7/22
U.S. Cl. 235—189 **2 Claims**



1. An electronic coordinate transformation apparatus comprising in combination:

a plurality of analog control units to receive input coordinate signals, wherein said plurality of analog control units comprise a first and second operational amplifier, said first operational amplifier receiving a first input coordinate signal, said second operational amplifier receiving a second input coordinate signal, said first and second operational amplifiers being connected to said plurality of analog signal processing units, and

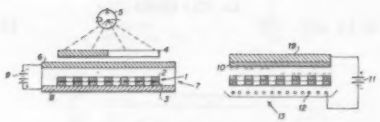
a plurality of analog signal processing units connected to said plurality of analog control units to process said input coordinate signals, said plurality of analog signal processing units connected to receive orientation signals, said plurality of analog processing units combining said input coordinate signals and orientation signals to provide output transformation signals, wherein said plurality of analog signal processing units comprise a first, second, third and fourth multiplier units, said first and second multiplier units respectively receiving the output from said first operational amplifier and a first orientation signal, said third and fourth multiplier units respectively receiving the output from said second operational amplifier and a second orientation signal, said first, second, third and fourth multiplier units respectively combining the applied input signals, said first and fourth multiplier units providing a first output transformation signal, said second and third multiplier units respectively providing a second output transformation signal.

3,975,626

PROCESS AND APPARATUS FOR FORMING ELECTROSTATIC CHARGE PATTERNS

Jozef Leonard Van Engeland, St. Katelijne-Waver, and Arnold August Willem, Schoten, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 22, 1975, Ser. No. 543,120
Claims priority, application United Kingdom, Jan. 23, 1974, 3200/74
Int. Cl.² G03G 13/00, 15/00
U.S. Cl. 250—315 A **28 Claims**



1. A method for producing an electrostatic charge pattern on an insulating charge-receiving member comprising the steps of:

1. depositing an electron-image or ion-image, resulting from the image-wise exposure to ionizing radiation of a means or medium capable of emitting photoelectrons, onto an electrically insulative layer of a multilayer screen consisting of an array of apertures and comprising at least a conductive screen layer and an adjacent insulative screen layer, said depositing resulting in the formation of an electrical double layer charge on opposite surfaces of the insulative layer, which double layer charge produces fringing fields within the apertures,

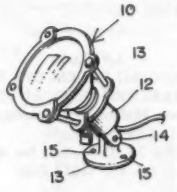
2. positioning the multilayer screen with its image-wise charged insulative screen layer in front of a charge-receiving material and projecting under the influence of a propulsion field charged particles of the same charge sign as the charged particles deposited on the outerside of the insulative screen layer towards the conductive screen layer, whereby by the presence of the propulsion field and said fringing fields acting as blocking fields charged particles are image-wise received on said charge-receiving material.

3,975,627

BURGLAR-PROOF GUARD FOR LIGHT BULBS

Harry J. Huber, 1432 NE. 150th St., North Miami, Fla. 33161

Filed July 9, 1975, Ser. No. 594,606
Int. Cl.² F21V 15/00, 17/00
U.S. Cl. 240—102 R **3 Claims**



1. A burglar-proof guard for light bulbs having a socket and a peripheral shoulder mounted on said socket, comprising a first pair of substantially semi-circular frame members having aligned bores formed at their end portions, a second pair of substantially semi-circular frame members having aligned bores formed at their end portions, said first pair of frame members being adapted to be mounted on a light bulb and said second pair of frame members engaging said shoulder of said socket, rod means extending through said aligned bores of first and second frame members for securing said frame members

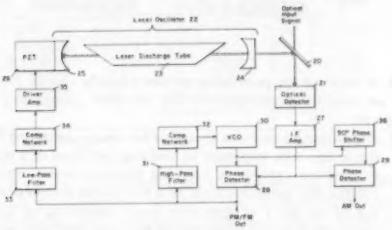
together, one of said rod means having a bore at one end for receiving a lock for preventing the unauthorized removal of said light bulb from said socket.

3,975,628

OPTICAL HETERODYNE RECEIVER WITH PHASE OR FREQUENCY LOCK

Ross E. Graves, Pacific Palisades, and Lyle S. Stokes, North Hollywood, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 2, 1975, Ser. No. 564,581
Int. Cl.² H03D *1/24*
U.S. Cl. 250—199 **10 Claims**



1. An optical heterodyne receiver comprising, in combination:

a tunable laser oscillator, said laser oscillator having an output and a control input;

means for combining said laser oscillator output with a received optical input signal;

an optical detector coupled to said combining means, said optical detector being adapted to provide an intermediate frequency signal representative of the difference between said laser oscillator output and said received input signal;

a controllable r.f. oscillator having a reference signal output and a control input;

comparison means for generating a wideband control signal representative of the difference between said intermediate frequency signal and said reference signal;

first means for coupling a first component of said control signal to said control input of said laser oscillator;

second means for coupling a second component of said control signal to said control input of said controllable r.f. oscillator; and

r.f. detector means coupled to said comparison means for deriving an output signal from said receiver.

3,975,629

ADAPTIVE IMAGING TELESCOPE WITH LINEAR SENSING AND ELECTRO-OPTICAL PHASE SHIFTING

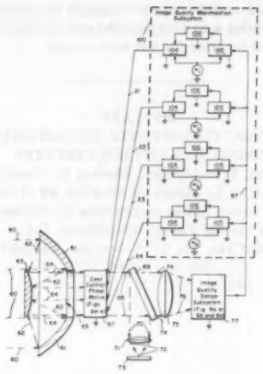
Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 24, 1974, Ser. No. 482,185
Int. Cl.² G01J *1/20*
U.S. Cl. 250—201 **17 Claims**

1. In an adaptive imaging telescope for detecting an optical beam received at the aperture of the telescope which provides an optical image at the image plane of said aperture, comprising in combination:

an electro-optic phase shifter, including a planar crystal having two major surfaces and a plurality of electrodes attached to the major surfaces, which phase shifter is positioned substantially at the optical image plane of the aperture of the telescope, responsive to the optical image;

first means, optically coupled to the phase shifter, positioned substantially orthogonally to said optical beam, for converting said beam into an electrical signal which electrical signal is linear in magnitude with respect to the signal of said optical beam; and



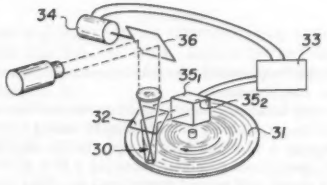
second means, electrically coupling the first means and the phase shifter, for providing phase modulation of the optical beam.

3,975,630

METHOD OF GUIDING A LIGHT BEAM ON AN OPTICAL SIGNAL TRACK

Karl-Ludwig Zorn, Berlin, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 11, 1975, Ser. No. 567,283
Claims priority, application Germany, Apr. 13, 1974, 2418195
Int. Cl.² G11B *7/00*; G05B *1/00*
U.S. Cl. 250—202 **6 Claims**



1. Method of obtaining and utilizing control signals for laterally tracking an optical record track having sharp transitions from light to dark or vice versa at the sides of the track, by an optical reading device provided with light beam projector means for illuminating a spot on said track, said optical record being movably mounted for movement of said track past said spot, means for guiding the beam produced by said projector means laterally of said track in response to tracking control signals and means for detecting information recorded on said track by detecting light of said beam by a sensor centered with respect to said track, said method comprising the steps of:

causing the light of said light beam, by means of an optical system, to converge in a focal region in the vicinity of a portion of said track;

controlling the spacing between said optical system and said track so that said focal region is at a predetermined distance from said track measured along the axis of said beam as projected from said optical system, said distance being such that said beam is of a width at least sufficient to span the full width of said track, and

differentially measuring the relative amounts of light of said beam projected beyond said track on the two sides of a bisector of said beam parallel to the longitudinal direction of the portion of said track illuminated by said beam to derive lateral tracking control signals by the Foucault principle when an edge of said track intersects a substantial portion of said beam and providing said tracking control signals to said guiding means to produce lateral control thereof with respect to said track in response to the differential measuring result.

3,975,631

STRUCTURES FOR DETECTING FOCAL ADJUSTMENT OF OPTICAL SYSTEMS

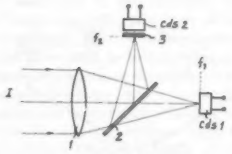
Hideomi Takeda, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

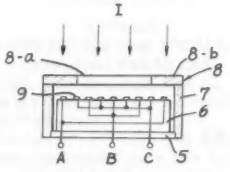
Filed Dec. 11, 1974, Ser. No. 531,771

Claims priority, application Japan, Dec. 12, 1973, 48-141024

Int. Cl.² G01J 1/44; H01J 39/04

U.S. Cl. 250—211 R **8 Claims**





1. For use in the focalizing of an optical system which has a focal plane, composite photoconductive means situated at the region of said focal plane and including a pair of photoconductive portions, a substrate carrying said photoconductive means, a light-diffusing means situated in front of one of said photoconductive portions for diffusing light which reaches said one photoconductive portion, light-transmitting means situated in front of the other of said photoconductive portions for transmitting non-diffused light thereto, whereby said photoconductive portions generate separate photoelectric outputs in response to diffused and non-diffused light impinging respectively on said one and said other of said photoconductive portions, and electrical means electrically connected with said photoconductive portions for comparing said outputs thereof to detect from said comparison of said outputs the focal adjustment of said optical system, said photoconductive means including for said pair of photoconductive portions thereof a pair of electrodes and a common electrode therebetween, said electrodes all being separate from each other while said pair of electrodes which respectively form said pair of photoconductive portions are situated in a common plane at a surface of said photoconductive means.

3,975,632

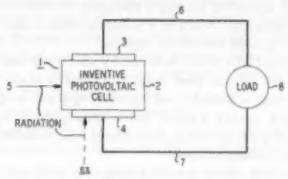
PHOTOVOLTAIC GENERATION AND DEVICE

Alastair Malcolm Glass, Millington, and Dietrich von der Linde, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1975, Ser. No. 603,349

Int. Cl.² H01J 39/12

U.S. Cl. 250—212 **12 Claims**



1. Photovoltaic device for operation in the visible and near visible spectrum comprising a body of photovoltaic material together with electrodes for drawing current from the said body, said body evidencing remanent electrical polarization in such direction as to result in a component in the direction defined by the said electrodes, characterized in that said body consists essentially of a pyroelectric host material and a solute material, the said solute having an upper absorption edge within the wavelength range of from 5μm to 0.1μm and being present at sufficient concentration to result in an absorption length at a wavelength of electromagnetic radiation in the said range of a maximum equal to a dimension of the said body, the said solute evidencing a dipole moment of at least 0.01 Debye in its ground state, the said solute having a light conductivity of at least 10^{-14} $(ohm\text{-}cm)^{-1}$ $(Wcm^{-2})^{-1}$, the said host in its undoped condition having an absorption length most equal to that of the host solute material for the said wavelength, whereby the said solute is electrically aligned by the said host, the said solute, upon absorbing a quantum of energy, releases a charge carrier which moves under the influence of the polarization of the host, which in turn makes a contribution to an overall net electronic flow, whereby charge accumulation results at the electrodes-body interfaces.

3,975,633

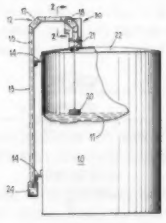
ANALOG TO DIGITAL ENCODER UNIT EMPLOYING A PRE-ENCODED FILM

Kenneth A. Larkin, Modesto, Calif., assignor to E. & J. Gallo Winery, Modesto, Calif.

Filed July 11, 1975, Ser. No. 595,185

Int. Cl.² H01J 3/14

U.S. Cl. 250—237 R **20 Claims**



1. An optical encoder unit for generating digital electrical signals defining the absolute position of a movable member from a rotatable shaft coupled to said movable member, said optical encoder unit comprising:

a support member;
first and second film reels rotatably secured to said support member;
motion translating means coupled to said reels for transferring motion therebetween;
guide means secured to said support member;
a radiation detection station mounted adjacent said guide means, said station including a radiation source for generating a plurality of spaced radiation beams and a radiation detector assembly having a plurality of radiation sensitive means each associated to a different one of said beams for generating said electrical signals;
a pre-encoder film strip received by said reels and guided by said guide means past said detection station, said film strip having a plurality of laterally spaced, longitudinally extending coded tracks, each arranged to occupy the radiation path between said source and a different one of said generating means;
a non-slip film drive means engagable with said film strip and having an input shaft adapted to be coupled to said rotatable shaft; and
means for maintaining tension in said film strip as said strip is translated past said detection station from reel to reel in response to rotation of said film drive means.

3,975,634

WATER WASHABLE DYE PENETRANT COMPOSITION AND METHOD UTILIZING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 444,432, Feb. 21, 1974, Pat. No. 3,915,885. This application May 22, 1975, Ser. No. 580,105
Int. Cl.² G01N *21/16*
U.S. Cl. 250—302 **13 Claims**

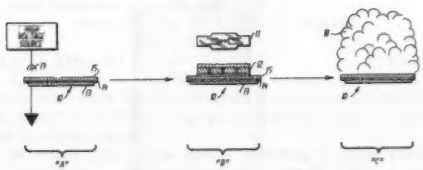
1. A method for detecting cracks and flaws in the surface of an object, which comprises applying to said surface a water washable biodegradable liquid dye penetrant composition which contains essentially of (1) a nonionic surfactant in the form of a mixture of straight chain, primary, aliphatic oxyalkylated alcohols, wherein said alcohols can have from 8 to 20 carbon atoms and the oxyalkyl groups are a mixture of ethylene oxide and propylene oxide groups, and (2) a small amount of a dye soluble in said surfactant; removing said dye penetrant composition from said surface without removing said dye penetrant composition from said cracks and flaws in said surface, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and flaws.

3,975,635

XERORADIOGRAPHIC PLATE

John H. Lennon, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 24, 1975, Ser. No. 543,796
Int. Cl.² G03B *41/16*
U.S. Cl. 250—315 A **6 Claims**



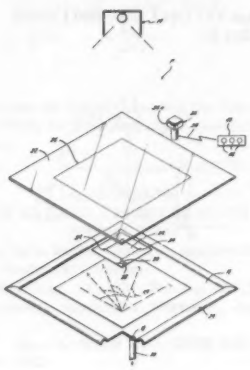
1. A xeroradiographic plate consisting essentially of a conductive backing having thereon a photoconductive layer of selenium and an intermediate layer selected from the group consisting of polyvinyl carbazole and an alloy of from about 15 to about 45% by weight of arsenic and from about 55 to about 85% by weight of selenium.

3,975,636

PRINTER FOR COLOR DISPLAY OF GEOPHYSICAL AND OTHER DATA

Emmett J. Klein, Jr.; Clyde W. Hubbard, Jr., both of Houston, Tex., and Lloyd R. Chapman, Sevenoaks, England, assignors to Seiscom Delta Inc.

Division of Ser. No. 441,012, Feb. 11, 1974. This application Mar. 6, 1975, Ser. No. 555,848
Int. Cl.² G03B *27/04*; G03C *5/16*
U.S. Cl. 250—327 **6 Claims**

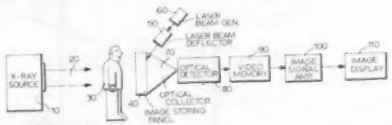


1. A printer for depositing a polymer coating on a display backing according to the presence of assigned numerical values of functions in data in an image which varies in density according to the presence of assigned numerical values of functions in the data values which are to be represented on the display backing as various colors by color toners which adhere to the deposited polymer coating, comprising:
a. light source means for illuminating the polymer coatings to be deposited with ultraviolet light;
b. a display backing for receiving photopolymer deposited thereon;
c. a sheet of laminate containing photopolymer for deposition onto said display backing;
d. a base for receiving said display backing with said sheet of laminate superimposed on said display backing;
e. an image varying in density according to the presence of assigned functions, said image being mounted above said sheet of laminate;
f. an optical screen for forming the ultraviolet light into discrete areas through said image and said sheet of laminate onto said display backing; and
g. means for holding said screen means and said positive image in position with respect to said sheet of laminate and said display backing during illumination by said light source means for illuminating wherein a polymer coating is deposited.

3,975,637
DEVICE FOR STORAGE AND DISPLAY OF A RADIATION IMAGE

Masaru Ikedo, Neyagawa; Yoshitake Yasuno, Kyoto, and Tadaoki Yamashita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 23, 1974, Ser. No. 517,438
Claims priority, application Japan, Oct. 23, 1973, 48-119598; Sept. 6, 1974, 49-103201
Int. Cl.² G03C 5/17; G01T 1/11
U.S. Cl. 250—327 4 Claims

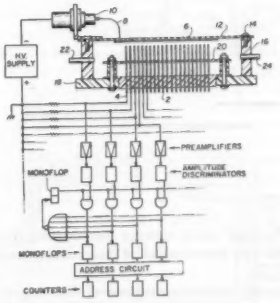


1. An instrument for storage and display of a radiation image comprising; an image storing panel for receiving electro magnetic radiation which passes through matter to be examined and storing the X-rays in a pattern of intensities proportional to the intensities in the radiation image, the image storing panel being composed of a layer of thermoluminscent material on a substrate, the thermoluminescent material having at least one glow peak in temperature range of from 60° to 300°C; a laser beam source directed toward said panel for heating the panel; focusing means in the path of the laser beam for focusing the laser beam; scanning means in the path of the laser beam for causing the laser beam to scan the image storing panel; a visible filter in the path of the laser beam for filtering visible light from the laser beam so that the laser beam is composed of infrared light but not visible light; and means positioned relative to the panel for detecting the thermoluminescent emissions from the panel as a series of light signals.

3,975,638
METHOD AND DEVICE FOR LOCALIZATION OF IONIZING PARTICLES

Claude Grunberg, Versailles, and Jean Le Devehat, Longjumeau, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 29, 1974, Ser. No. 518,992
Claims priority, application France, Nov. 7, 1973, 73.39574
Int. Cl.² G01T 1/22, 1/18
U.S. Cl. 250—385 3 Claims



1. A detector for two-dimensional localization of the trajectory of ionizing particles comprising:

a multiplicity of cathode electrodes in the form of mutually insulated separate sheet segments of conducting material of such shape and disposition that if they were extended so as to make contact with each other, they would form a continuous sheet;

an anode in the form of a two-dimensional array of elongated pointed elements electrically connected together and having their points respectively opposite said cathodes at a uniform spacing from the respective cathodes, the space between said anode and said cathodes being free of metallic obstructions;

a chamber for maintaining an ionizable gas unobstructedly between said anode and said cathodes and between the elongated pointed elements of said anode for a substantial length thereof away from their points, said chamber being constructed so as to permit independent electrical connections to the respective cathodes and to said anode outside the chamber;

an ionizable gas in said chamber;

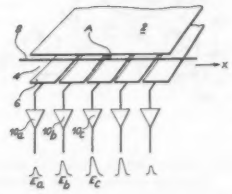
means for applying an electric potential of the order of a few thousand volts between said anode and said cathodes, and

means, including impedances interposed between said cathodes, respectively, and said electrical potential applying means, for detecting the points of impact and of flux of ionizing particles by measuring the count rate of electrical pulses at each cathode.

3,975,639
PARTICLE LOCALIZATION DETECTOR

Robert Allemand, Saint-Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 17, 1974, Ser. No. 533,474
Claims priority, application France, Dec. 21, 1973, 73.46051
Int. Cl.² G01T 1/18
U.S. Cl. 250—385 12 Claims



1. A particle localizaton detector which operates in the proportional regime, wherein said detector comprises a leak-tight chamber filled with a fluid and within said chamber an electrode of a first type constituted by at least one conducting wire and an electrode of a second type constituted by at least one conducting plate having the shape of a portion of a cylindrical surface having generating-lines which are parallel to the direction of said conducting wire, the contour of which conducting plate being such as to provide substantially a one-to-one correspondence between the position of a point of said wire and the solid angle which subtends said plate at said point and means for collecting the electrical signal which appears on said plate.

3,975,640
PROCESS FOR CENTERING AN IONIZING RADIATION SWEEP BEAM AND DEVICE FOR CARRYING OUT THIS PROCESS

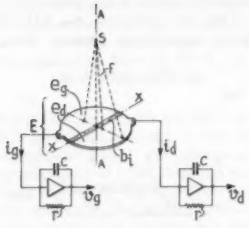
René Boux, and Jean Noël Bourlier, both of Paris, France, assignors to C.G.R.-Mev., Paris, France

Filed June 3, 1975, Ser. No. 583,290
Claims priority, application France, June 7, 1974, 74.19833
Int. Cl.² G01T 1/16; H01J 39/28
U.S. Cl. 250—385 8 Claims

1. A process for centering, with respect to a target of predetermined position, an ionizing radiation sweep beam subjected

to a sweep control voltage V_B in a predetermined plane, using at least one ionization chamber provided with at least one electrode divided into $2n$ electrically conductive elements, n being an integer equal to or greater than 1, said elements being disposed symmetrically with respect to an axis perpendicular to the considered sweep plane, two adjacent elements being separated from each other by an insulating strip, all of the elements disposed on one side of said axis receiving an ionic current i_d and all of the elements disposed on the other side of said axis receiving an ionic current i_g, said process comprising the following steps:

amplifying the voltage difference $v_d - v_g$ respectively corresponding to the currents i_d and i_g received at said electrode, the signal obtained being $V_E = k\ (v_d - v_g)$;



comparing the signal V_E with threshold voltages $-v_r$ and $+v_r$;

comparing the beam sweep control voltage V_B with threshold voltages $-v_b$ and $+v_b$;

detecting either a signal V_p corresponding to the couple of values:

$$V_p \rightarrow \begin{matrix} V_E > +v_r \\ V_B < -v_b \end{matrix}$$

or a signal V_n corresponding to the couple of values:

$$V_n \rightarrow \begin{matrix} V_E < -v_r \\ V_B > +v_b \end{matrix}$$

said detected signals V_p or V_n indicating the direction and amplitude of the deviation of the centering of the sweep beam with respect to the axis XX of the electrode;

3,975,641

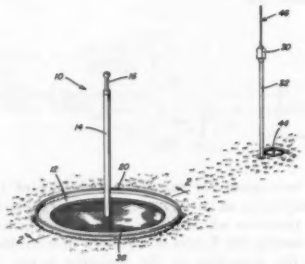
LOW LEVEL SNOW PRECIPITATION GAUGE

Roderick G. Morrison, Boise, Idaho, assignor to Idaho Industrial Instruments, Inc. (Entire), Boise, Idaho

Filed Aug. 23, 1974, Ser. No. 500,174

Int. Cl.² G01T 1/00

U.S. Cl. 250—393 **22 Claims**



1. A precipitation gauge comprising a source of radiation emitted from a geometrically fixed zone of substantial extent, a plurality of detectors, means mounting said detectors in fixed spaced relation to each other for receiving said radiation from said source at point locations spaced from said geometrically fixed zone and means connected to said detectors for registering changes in radition density as a result of radiation attenuation along radiation paths between said fixed zone and said point locations.

3,975,642

IMAGE SECTION OF AN X-RAY APPARATUS

Heinz-Peter Kunert, Tangstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

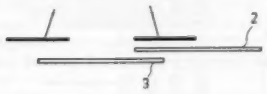
Continuation of Ser. No. 373,507, June 25, 1973, abandoned.

This application Jan. 27, 1975, Ser. No. 544,350

Claims priority, application Germany, July 1, 1972, 2232413

Int. Cl.² G03B 41/16

U.S. Cl. 250—468 **2 Claims**



1. A method of more quickly positioning X-ray film for exposure followng interruption of fluoroscopy, comprising the steps of:

simultaneously with interruption of fluoroscopy, closing a diaphragm positioned between the film exposing area and the X-ray tube to block post-radiation from said area;

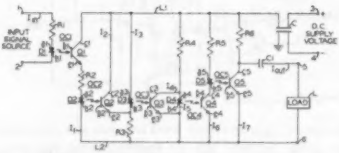
at the same time, moving X-ray film into said exposing area at a lower speed, so that post-radiation is screened from said film by said diaphragm; and

when there is no longer any danger of exposing moving film to post-radiation, opening said diaphragm.

3,975,643
FAIL-SAFE OPTO-ELECTRONIC PHASE INVERTING CIRCUITS

Charles V. Toth, McKeesport, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jan. 23, 1974, Ser. No. 435,679
Int. Cl.² H01J 39/12; G02B 27/00
U.S. Cl. 250—551 7 Claims

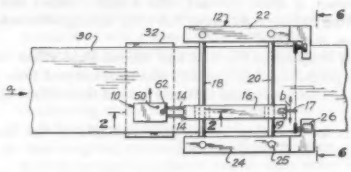


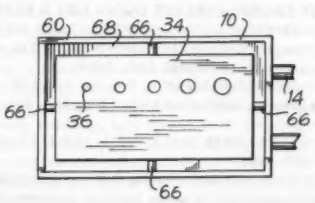
7. A vital circuit arrangement comprising a pair of cascaded optical couplers each having a light emitting device and a light responsive device, a source of periodic input signals coupled to said light emitting device of one of said pair of said cascaded optical couplers for causing inphase periodic light signals to be directed onto said light responsive device of said one of said pair of said cascaded optical couplers and for causing inphase conduction of said light responsive device of said one of said pair of said cascaded optical coupler, said light responsive device of said one of said pair of said cascaded optical couplers coupled to said light emitting device of the other of said pair of said cascaded optical couplers for causing out-of-phase periodic light signals to be directed onto said light responsive device of said other of said pair of said cascaded optical couplers for causing out-of-phase conduction of said light responsive device of said other of said pair of said cascaded optical couplers so that out of phase periodic output signals are produced by said other of said pair of said cascaded optical couplers.

3,975,644
FLAW DETECTING METHOD AND APPARATUS

Erich Scharf, 20 Atwater Place, Massapequa, N.Y. 11758

Filed Aug. 16, 1974, Ser. No. 498,231
Int. Cl.² G01N 21/32
U.S. Cl. 250—563 13 Claims



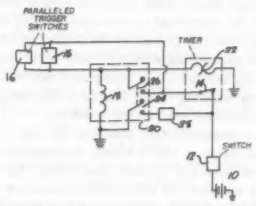


1. In a material monitoring apparatus for determining the quality of a sheet material, an assembly including housing means and support means connected with said housing means for supporting the same closely adjacent to a surface of a travelling sheet of material without any optical structure between said housing means and said sheet, said housing means being formed with a series of apertures which are arranged in a row extending in the direction of sheet travel with said apertures being of progressively larger sizes in the direction of sheet travel and being directed toward the sheet, a plurality of photoelectric sensing means carried by said housing means for receiving light respectively entering through said apertures thereof directly from the sheet while travelling only through a relatively small air gap between the sheet and the housing means closely adjacent thereto, the amount of light received being dependent upon the quality of the sheet material, traversing means operatively connected with said assembly for moving the latter cyclically first in one direction and then in an opposite direction transversely across the sheet while the latter travels longitudinally, electronic circuit means electrically connected with said plurality of sensing means for converting the light received thereby into electrical signals, and indicating means electrically connected with said electronic circuit means for responding to the electrical signals for indicating the quality of the material.

3,975,645
AUTOMOBILE ANTI-THEFT ALARM SYSTEM

Michael A. Morar, Hayward, Calif., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Nov. 20, 1974, Ser. No. 525,307
Int. Cl.² B60N 25/10
U.S. Cl. 307—10 AT 2 Claims

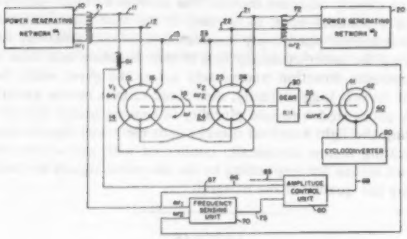


1. An automobile anti-theft alarm system comprising:
a battery connected at one end to ground;
a main switch connected on one side to the other end of the battery;
a relay having a normally deenergized winding with one end grounded, said relay having a first set of normally open contacts connected on one side to the other end of the winding and a second set of normally open contacts grounded on one side;
a timer which can be reset and which is normally deenergized, said timer having a normally closed timer switch, said timer being connected in parallel with the winding, said timer switch being connected between the other side of the main switch and the other side of the first set contacts;
an electrically operated alarm connected between the other side of the main switch and the other side of the second set contacts; and
a plurality of normally open trigger switches connected in parallel and disposed between the other end of the winding and the junction of the first set contacts and the timer relay, two of said trigger switches being elongated mercury tilt switches that are open when level and closed when tilted from the horizontal in the vertical direction, the longitudinal axes of the tilt switches being disposed at right angles to each other, the tilt switches being used to detect any movement or change in position of the automobile by closing when any movement or change occurs, said alarm being actuated whenever any trigger switch is closed.

3,975,646
ASYNCHRONOUS TIE

Lee A. Kilgore, Export; Gurney L. Godwin, and Eugene C. Whitney, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1975, Ser. No. 540,748
Int. Cl.² H02J 3/12
U.S. Cl. 307—21 **7 Claims**



1. A dynamoelectric machine system for transmitting electrical power from a first generating network to a second generating network, said dynamoelectric machine system comprising:

a first dynamoelectric machine having a rotor winding disposed upon a shaft which is journalled for rotation within an annular stator, said stator having a winding which is adapted for electrical connection to said first generating network whereby power by be delivered to or taken from said first generating network, said rotor and stator windings being wound for a predetermined number of poles, said rotor winding being magnetically coupled by mutual inductance with said stator winding;

a second dynamoelectric machine having a rotor winding disposed upon a shaft which is journalled for rotation within an annular stator, said stator having a winding which is adapted for electrical connection to said second generating network whereby power may be delivered to or taken from said generating network, said rotor and stator windings being wound for a predetermined number of poles, said rotor winding being magnetically coupled by mutual inductance with said stator winding;

said first dynamoelectric machine shaft being mechanically connected to said second dynamoelectric machine shaft for concurrent rotation therewith;

said first dynamoelectric machine rotor winding being electrically connected to said second dynamoelectric machine rotor winding in a closed electrical circuit; and

means for controlling the angular position and speed of rotation of said mechanically interconnected shafts.

3,975,647
BOOTSTRAP CIRCUIT

Akira Takei, Sagamihara, Japan, assignor to Keishin Matsumoto, Director-General, Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 547,938
Claims priority, application Japan, June 6, 1974, 49-63441
Int. Cl.² H03K 17/00
U.S. Cl. 307—228 **4 Claims**

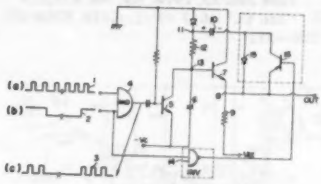
1. A bootstrap circuit for converting a series of rectangular input signal trains, successive said trains being separated by a predetermined time interval, into a corresponding series of separated sawtooth wave signal trains, comprising:

a voltage source;

an emitter follower transistor having an emitter, a collector, a base, and being responsive to each rectangular input signal of said signal trains being received at said base thereof;

a first capacitor electrically connected between the base of said emitter follower transistor and said voltage source;

a second capacitor electrically connected in a feedback loop between said base and said emitter of said emitter follower transistor;

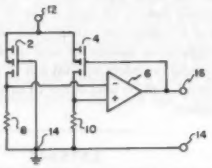


wherein the improvement comprises a switching circuit connected in series with said second capacitor in said feedback loop for opening said feedback loop during said time interval between successive said rectangular input signal trains.

3,975,648
FLAT-BAND VOLTAGE REFERENCE

Morley C. Tobey, Jr., Sunnyvale; David J. Giuliani, San Carlos, and Peter B. Ashkin, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 16, 1975, Ser. No. 587,188
Int. Cl.² H03K 1/12, 1/00, 1/02, 3/353
U.S. Cl. 307—297 **22 Claims**



1. A voltage reference comprising:

first and second field-effect devices, each having a source contact, a drain contact, and a gate contact and each device having a different flat-band voltage characteristic from the other;

means coupled to the first and second field-effect devices for producing substantially identical current flow to the drain contacts of the first and second field-effect devices; and

means for coupling to the gate contacts of the first and second field-effect devices.

3,975,649
ELECTRONIC CIRCUIT USING FIELD EFFECT TRANSISTOR WITH COMPENSATION MEANS

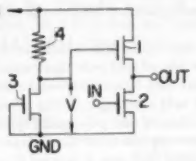
Hiroto Kawagoe, Kodaira, and Kosei Nomiya, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 20, 1974, Ser. No. 453,168
Claims priority, application United Kingdom, Jan. 16, 1974, 2105/74
Int. Cl.² H03K 3/353, 17/14, 19/08, 19/40
U.S. Cl. 307—304 **7 Claims**

1. In an electronic circuit having first and second field effect transistors connected in series between a terminal for connecting source of reference potential and a terminal for connecting a power supply source thereto, the improvement comprising a compensating circuit including:

a third field effect transistor, the source electrode of which is connected to said reference potential terminal, the gate

electrode of which is connected to the source electrode thereof, and the drain electrode of which is connected to the gate electrode of said second field effect transistor; and



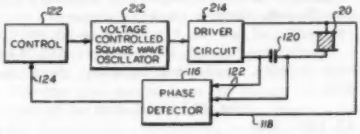
a resistor, the current flow therethrough being substantially linearly proportional to the voltage drop thereacross, connected between the drain electrode of said third transistor and power supply source terminal.

3,975,650

ULTRASONIC GENERATOR DRIVE CIRCUIT

Stephen C. Payne, 1114 Charleston National Plaza, Charleston, W. Va. 25301

Filed Jan. 30, 1975, Ser. No. 545,463
Int. Cl.² H01L 41/08
U.S. Cl. 310—8.1 13 Claims



1. An ultrasonic generator comprising:

a. a transducer adapted to vibrate in a fundamental frequency mode and the harmonics thereof in response to a predetermined electric signal;

b. generator means for generating a drive signal,

c. and driving means responsive to said driving signal for driving said transducer with said predetermined electric signal, said driving means comprising:

i. a pair of bistable devices each switchable between a conducting and a non-conducting state;

ii. connecting means for connecting said generator means with said pair of bistable devices for switching said bistable devices between their conducting and non-conducting states in phase opposition to each other in response to said driving signal;

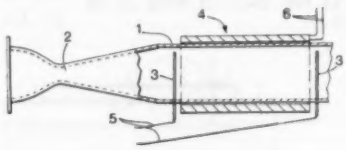
iii. and coupling means for coupling said pair of bistable devices to said transducer and to each other for applying said predetermined electric signal to said transducer in response to the switching states of said pair of bistable devices and for quickly driving one bistable device to its non-conducting state as the other bistable device begins to conduct, said coupling means comprising a transformer having a pair of primary windings inductively coupled to each other and at least a secondary winding inductively coupled to said pair of primary windings, lead means for connecting said secondary winding in circuit with said transducer, and lead means for connecting each one of said pair of primary windings in circuit with a respective one of said bistable devices and in phase opposition to each other whereby the current induced in one of said pair of primary windings due to the increase of current in the other of said pair of primary windings is in a direction to drive the bistable device connected to said one winding to the non-conducting state.

3,975,651

METHOD AND MEANS OF GENERATING ELECTRICAL ENERGY

Norman David Griffiths, 55, Seedfield Croft, Coventry, West Midlands, England

Claims priority, application United Kingdom, Mar. 27, 1974, 13689/74
Filed Mar. 27, 1975, Ser. No. 562,457
Int. Cl.² H02N 4/02
U.S. Cl. 310—11 6 Claims



1. Method of generating electrical energy comprising:

passing an electric current in a continuous manner axially through an electrically conductive fluid in an electrically non-conductive duct member so as to create a circumferential magnetic field within the fluid;

moving the fluid axially and continuously along the duct member at a high velocity relative to a further conductive device disposed exteriorly about the duct member, the further conductive device being formed for enabling radially directed electromotive forces and current flow to occur between inner and outer surfaces thereof and for obtaining resulting output current flow from said surfaces; and

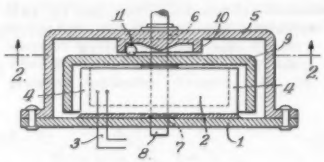
inducing radially directed electromotive forces and current flow in the further conductive device by the axial movement of the moving circumferentially directed magnetic field as such field travels with the electric current conducting fluid moving along the duct member.

3,975,652

NO-BACK CONTROL FOR A PERMANENT MAGNET ROTOR MOTOR

Robert J. Hammond, Stevensville, Mich., assignor to V-M Corporation, Benton Harbor, Mich.

Filed Sept. 30, 1974, Ser. No. 510,384
Int. Cl.² H02K 7/10
U.S. Cl. 310—41 8 Claims

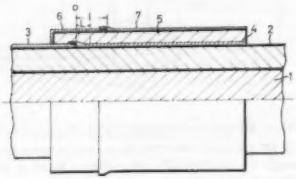


1. A one-way motor drive comprising in combination, a synchronous motor having a shaft, a permanent magnet rotor on said shaft, a field having magnetizable field poles and an AC field winding, and a mechanical one-way clutch mechanism, wherein the permanent magnet rotor has an upwardly facing horizontal circular track rotatable with the rotor, a stationary clutch member comprising a cage having an open bottom above the rotor registering with said track, a resilient rubber-like roller in said cage resting normally on said track, said cage having at one end a clutching surface inclined downwardly towards the track whereby movement of the rotor in the backward direction rolls said roller into wedging engagement with said downwardly inclined clutching surface and prevents backward rotation of the motor, and upon reversal of current assists in starting rotation of the rotor in the forward direction of rotation.

3,975,653
CREEPING DISCHARGE AND PARTIAL DISCHARGE PREVENTION MEANS FOR A COIL END OF A ROTARY ELECTRIC MACHINE

Takeshi Kawakami; Tsutomu Tani; Takatoshi Ishikawa, and Syoji Hirabayashi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1975, Ser. No. 557,910
Claims priority, application Japan, Apr. 17, 1974, 49-43810
Int. Cl.² H02K *3/40*
U.S. Cl. 310—196 **6 Claims**



1. A creeping discharge and partial discharge prevention means for a stator coil end of a rotary electric machine comprising:

a grounding electrode on an insulator of the stator coil end of the rotary electric machine;

a first electrical stress grading coated layer coated on the insulator of the stator coil end connected to an end of the grounding electrode;

a shield insulator of insulation material disposed adjacent the first electrical stress grading coated layer connected to an end of the grounding electrode;

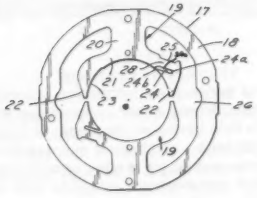
a shield electrode electrically connected to the grounding electrode and disposed adjacent to the shield insulator; and

a second electrical stress grading coated layer coated on the shield insulator connected to an end of the shield electrode.

3,975,654
SHADED POLE MOTOR

Paul E. Dryburgh, Owosso, Mich., assignor to Universal Electric Company, Owosso, Mich.

Continuation of Ser. No. 55,068, July 15, 1970. This application Nov. 24, 1971, Ser. No. 201,950
Int. Cl.² H02K *17/10*
U.S. Cl. 310—172 **16 Claims**



1. A shaded pole electric motor comprising

a rotor,

a stator,

said rotor and stator having an interface,

said stator having a plurality of generally radially extending poles which extend toward the stator rotor interface,

each said pole having a neck portion and a radially innermost end portion,

said radially innermost end portion having a greater circumferential extent than the neck portion and terminating in pole tips,

adjacent neck portions forming a kidney slot for receiving portions of windings,

a main winding wound around the neck portion of each said pole,

a shading coil slot in said radially innermost end of said pole adjacent one of said pole tips extending generally circumferentially and having opposed ends,

the end of said shading coil slot which is further from said neck portion of said pole being spaced from said interface a distance not less than the distance that the other end of said shading coil slot is spaced from said interface,

a shaded pole winding wound through said slot,

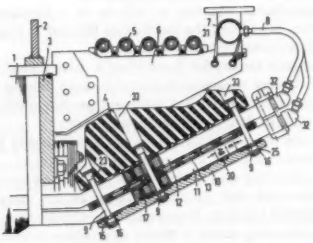
said shading coil forming the shaded pole portion of said radially extending pole,

substantially all portions of said main coil which are adjacent the shading coil being spaced radially from the portions of said shading coil which are on the axially outer ends of said stator such that none of said main coil overlies the axial ends of said shading coil.

3,975,655
COIL END SUPPORT FOR THE STATOR WINDING OF ELECTRIC MACHINES SUCH AS TURBO GENERATORS OR THE LIKE

Heinrich Beermann; Willi Jacobs, and Dietrich Lambrecht, all of Mulheim, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Continuation of Ser. No. 371,772, June 20, 1973. This application Feb. 25, 1975, Ser. No. 552,754
Claims priority, application Germany, June 26, 1972, 2231292
Int. Cl.² H02K *3/46*
U.S. Cl. 310—260 **1 Claim**



1. In an electric machine having a stator lamination stack, pressure plates for the stack and a stator winding formed with conductor bars and having a coil end, the coil end having conically shaped conductor sections extending transversely to the to the axis of the machine, a support for the coil end of the stator winding, a radially outwardly disposed support ring connected to the conductors of the coil end and extending over the entire circumference of the coil end, radially outwardly disposed holder arms secured to the pressure plates of the stator lamination stack, said support ring being axially displaceably guided on said holder arms, radially inwardly disposed cover plates extending over the entire circumference of the coil end, clamping bolts disposed in a multiplicity of rows and extending through the support ring and said cover plates and clamping them, with the conductor bars of the stator winding as well as plastically deformable cushioning members of hardenable material interposed therebetween, all together into a unitary structure resistant to shear and bending in all directions of stress.

3,975,656

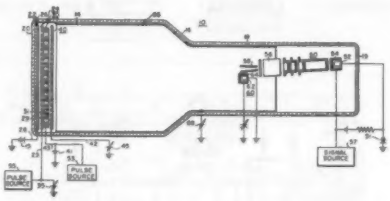
DIRECT VIEW STORAGE TUBE

John W. Newton, Pine City, and Wilson G. Helt, Elmira, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 138,447, April 29, 1971. This application Jan. 10, 1975, Ser. No. 540,209

Int. Cl.² H01J 29/08, 29/39

U.S. Cl. 313—397 3 Claims



1. A cathode ray tube storage system comprising an evacuated envelope and having therein a phosphor display screen, a non-storage current gain control grid closely spaced from the phosphor screen comprising an electrically conductive mesh with a thin coating of secondary electron emissive dielectric material disposed on the conductive mesh, which current gain control grid increases the electron current passing between the storage grid and the screen, a storage mesh spaced from the current gain control grid on the side opposite from the screen, which storage mesh comprises a conductive mesh and a dielectric coating on the mesh side opposite the screen for storage of charge in response to electron bombardment, a collector grid spaced from the storage mesh on the opposite side of the storage mesh from the screen, a writing electron gun for generating an electron beam to write a charge on the storage mesh, and a flood electron gun for generating and directing electrons through the storage mesh.

3,975,657

METHOD OF AND APPARATUS FOR CONTROLLING AMOUNT OF ELECTRON BEAM IN IMAGE PICKUP TUBE

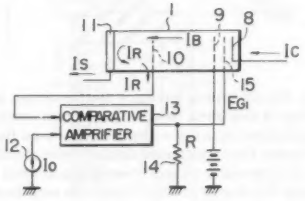
Kazuhiro Sato, Tokyo; Shizuka Ishibashi, and Yoshizumi Eto, both of Hachioji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Co., Ltd., both of, Japan

Filed Mar. 7, 1974, Ser. No. 449,108

Claims priority, application Japan, Mar. 9, 1973, 48-27039

Int. Cl.² H01J 31/26

U.S. Cl. 315—10 16 Claims



1. In a photoconduction type image pickup tube having a return beam defined to be the difference between a scanning beam current emitted from a cathode and radiated on a photoelectric conversion target and a signal current derived from the outside of said photoelectric conversion target, a method of controlling said tube comprising the steps of generating a signal which, under any operating condition of the tube, is proportional to said return beam from the photoelectric conversion target of the image tube and controlling the amount of the scanning electron beam in accordance with said generated signal.

3,975,658

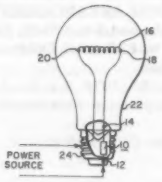
MASS OF CURRENT INRUSH LIMITERS

Peter R. Emtage, Pittsburgh; Philip J. Nalepa, Greensburg, and Robert C. Miller, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,737

Int. Cl.² H05B 39/04

U.S. Cl. 315—71 6 Claims



1. A circuit arrangement for effectively eliminating the inrush-current overshoot when an incandescent lamp is connected to a power source, said circuit arrangement comprising:

a. an incandescible tungsten lamp filament; and

b. a current-inrush limiter comprising a negative temperature coefficient thermistor electrically connected in series with said filament, said current-inrush limiter having a room temperature resistance of between about 0.9 and 10 times the hot resistance of said filament and a steady state operating resistance of less than about 1% of said hot resistance of said filament, and said thermistor having an effective mass equal to a constant multiplied by the mass of the filament multiplied by the initial ratio of thermistor current to filament current, and divided by the difference in calories/gram between the hot heat content per unit mass of the thermistor and the cold heat content per unit mass of the thermistor, where said constant is between 400 and 4000.

3,975,659

LAMP WITH AN INTEGRATED FLASHER DEVICE

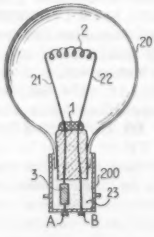
Pierre Merenda, and Jean Claude Reymond, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 12, 1975, Ser. No. 557,783

Claims priority, application France, Mar. 15, 1974, 74.08882

Int. Cl.² H01J 19/78

U.S. Cl. 315—72 4 Claims



1. An incandescent lamp with an inner flasher device, comprising:

a glass envelope,

a pair of lead-in conductors carrying a filament which is within said envelope and in series with said conductors,

a block of material containing vanadium dioxide connected in parallel with said filament inside said envelope, said lead-in conductors passing through said block at two spaced points,

a resistor connected in series with one of the lead-in conductors.

3,975,660

STARTERLESS LOW-VOLTAGE FLUORESCENT-LAMP CIRCUIT ARRANGEMENTS

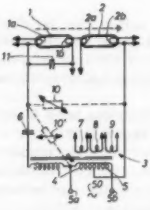
Fritz Knobel, Ennenda, and Ernst Meili, Uster, both of Switzerland, assignors to F. Knobel Elektro-Apparatebau AG, Ennenda, Switzerland

Filed Mar. 27, 1975, Ser. No. 556,535

Claims priority, application Switzerland, Mar. 28, 1974, 4303/74

Int. Cl.² H05B *41/232*

U.S. Cl. 315—102 **5 Claims**



1. A starterless circuit arrangement for the ignition and operation of at least one low-voltage fluorescent lamp in a series connection, comprising in combination: at least one fluorescent lamp connected in circuit with a stray-field transformer, a voltage source, said transformer being connected to said source, and generating a no-load voltage required for the ignition of said lamp, the latter having electrode means, said transformer being provided with at least one heating winding connected with said electrode means, and with a secondary winding, a cold conductor possessing markedly positive resistance characteristics, connected in parallel with at least part of said secondary winding in order to maintain the voltage applied to said lamp at a value beneath the ignition voltage, for such length of time until said electrode means are preheated.

3,975,661

DRIVING METHOD FOR A THIN-FILM ELECTROLUMINESCENT ELEMENT OF A THREE-LAYER CONSTRUCTION

Yoshiharu Kanatani; Masahiro Ise; Etsuo Mizukami, all of Tenri, and Chuji Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed June 19, 1974, Ser. No. 480,723

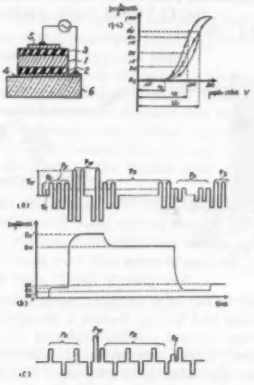
Claims priority, application Japan, June 19, 1973, 48-69440

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **16 Claims**

1. A driving method for a thin-film electroluminescent element comprising an electroluminescent layer sandwiched between two transparent dielectric layers forming a sandwiched structure, said electroluminescent layer having a given threshold voltage level for initiating electroluminescence therein and said sandwiched structure exhibiting the hysteresis loop phenomenon within the light emission versus applied voltage characteristics along the increasing and the decreasing process of the amplitude of the applied voltage where the applied voltage exceeds the threshold level, comprising the step of;

applying alternating sustaining pulses to the element for maintaining the light emission, the amplitude of the sustaining pulses being chosen at the voltage level appearing



at the point in the hysteresis loop characteristics where the difference between the minimum light brightness on the voltage increasing curve and the maximum light brightness on the voltage decreasing curve is substantially a maximum.

3,975,662

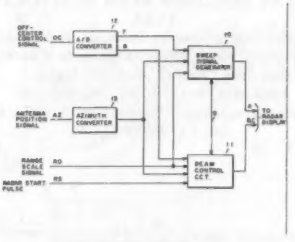
OFF-CENTER RADAR DISPLAY CIRCUIT

Milton J. Janosky, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 10, 1975, Ser. No. 548,502

Int. Cl.² H01J *29/78*

U.S. Cl. 315—378 **9 Claims**



1. In a display system having a display device upon which information is displayed using display traces emanating from a first point thereon, a trace origin control used for indicating a second point from which said display traces should emanate, and means responsive to said trace origin control indications for moving the display of information on said device causing said display traces to emanate from said second point comprising

means responsive to said trace origin control indications for generating first control signals and including display blanking means responsive to second control signals to control said display device to blank or unblank said display traces, and

trace control means responsive to said first control signals for generating second signals causing said display device to move said display traces to emanate from said second point.

3,975,663

METHOD OF AND APPARATUS FOR DETECTING GROUND FAULTS IN ELECTRICAL SYSTEMS

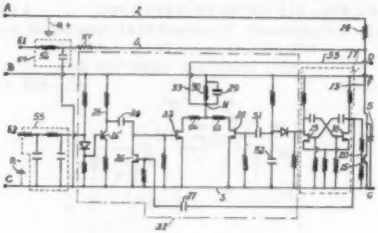
Ernest J. Moorey, Devon, England, assignor to Western Industries (Proprietary) Ltd., Johannesburg, South Africa

Continuation-in-part of Ser. No. 368,071, June 8, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,083

Claims priority, application South Africa, June 13, 1972, 72/4072; June 13, 1972, 72/4073

Int. Cl.[2] H02H 3/16

U.S. Cl. 317—18 R 11 Claims



3. Apparatus for detecting ground faults in ungrounded equipment including a chassis and having an electrical supply, the apparatus comprising:

a chassis ground terminal of the equipment connected to either side of the supply means for impressing a voltage variable alternately between two predetermined values on the terminal relative to one side of the supply;

a voltage detector connected to measure varying potential between said side and the chassis ground;

a monitor connected to the detector to indicate variations in the potential and a relay connected to the monitor connected to control the supply to the equipment.

3,975,664

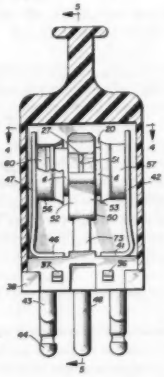
LINE PROTECTOR FOR COMMUNICATION CIRCUIT

Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed July 28, 1975, Ser. No. 599,700

Int. Cl.[2] H02H 3/22, 7/20

U.S. Cl. 317—66 9 Claims



1. A line protector for a communication circuit comprising: a protector unit having a body, first and second end terminals on said body, line terminals connected to said end terminals and arranged for connection to a pair of communication lines, a third intermediate terminal on said body, a ground terminal connected to said intermediate terminal, said protector unit including electrodes forming a part of said terminals and comprising breakdown voltage means in the circuit between said first and third terminals and in the circuit between said second and third terminals to provide a high impedance at a voltage below a predetermined value and a low impedance at a voltage above said predetermined value, conductive caps positioned over said end terminals and each having a portion extending over said body toward opposite sides of said intermediate terminal, said conductive caps each being spaced from said opposite sides of said intermediate terminal to provide high impedances therebetween, spring-bias means secured to said line terminals and extending therefrom to provide electrical contact with said caps and to apply longitudinal forces on said caps to move said caps toward said intermediate terminal, and means within each of said caps opposing said spring-bias means for maintaining said spaces when the current between said end terminals and said intermediate terminal is below a predetermined minimum value but operable to cause at least one of said caps to move toward said intermediate terminal to form a direct metallic ground circuit therewith when the current between said end terminals and said intermediate terminal is above said predetermined minimum value.

3,975,665

WIRELESS SET HAVING CIRCUIT PLATE BARS ARRANGED IN A FRAME

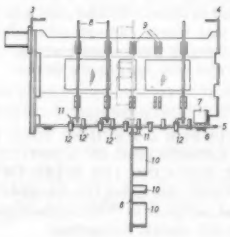
Ludwig Höll, Sandweier; Adalbert Winkler, Baden-Baden, and Eberhard L. Grünewald, Rastatt, all of Germany, assignors to Becker Flugfunkwerk, Baden-Baden-Oos, Germany

Filed Aug. 2, 1974, Ser. No. 494,146

Claims priority, application Germany, Aug. 18, 1973, 7330252

Int. Cl.[2] H02B 1/02

U.S. Cl. 317—101 DH 2 Claims



1. A miniature compact mobile wireless radio telephone, aircraft and navigational communications set having a chassis defining an interior provided with closely-spaced channels for receiving a plurality of closely-spaced circuit plate bars with printed circuit elements and having a plurality of conductive guide pins disposed along one edge comprising:

a flat cable plate including printed circuit elements contained therein and having a plurality of rows of first socket means mounted in said channels and extending into said interior of said chassis, each row for receiving the conductive guide pins of one of said circuit plate bars so as to retain said circuit plate bars within the chassis of the communications set; and said flat cable plate having a plurality of rows of second socket means electrically connected respectively in pairs by means of said printed circuit elements to said plurality of rows of first socket means and mounted in said chassis and extending exteriorly of said plate to permit the conductive guide pins of said circuit plate bars to be selectively connected to a corresponding row of said second socket means so that the circuit elements would be freely accessible externally for testing, said plurality of rows of second socket means being directed opposite to said plurality of rows of first

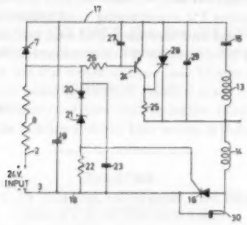
socket means so that said circuit plate bars can be removed from said first socket means and connected to said second socket means in an opposite direction, said plurality of rows of first and second socket means are spaced apart relative to the chassis to permit said circuit plate bars to be tested externally of the chassis.

3,975,666

PNEUMATIC AND HYDRAULIC CONTROL VALVES

Robert J. Redding, Maidenhead, England, assignor to Skinner Precision Industries, Inc., New Britain, Conn.

Filed Aug. 5, 1974, Ser. No. 495,086
Int. Cl.² H01H 47/32
U.S. Cl. 317—151 4 Claims



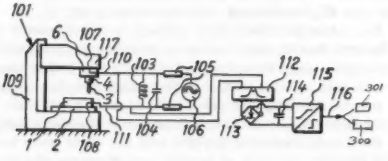
2. An intrinsically safe electrical circuit adapted to control the operation of an electromagnetically-operated device having two operating coils in series, including a safety barrier connected to a source, first electrical energy storage means which is charged from said source through said safety barrier at an intrinsically safe energy level and is subsequently at least partially discharged by a switching means through both said operating coils to set said device, a second energy storage means connected in series with said coils and arranged to be charged from said source through said safety barrier and means for discharging said second energy storage means through one of said coils to reset the device.

3,975,667

APPARATUS FOR A MACHINE TOOL FOR THE AUTOMATIC GENERATING OF A SWITCHING SIGNAL AND FOR REDUCING THE SPEED OF A TOOL

Michael Bory, Zurich, and Georg Grendelmeier, Dietikon, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Nov. 11, 1974, Ser. No. 522,745
Claims priority, application Switzerland, Nov. 19, 1973, 16240/73
Int. Cl.² H02P 7/00
U.S. Cl. 318—39 11 Claims



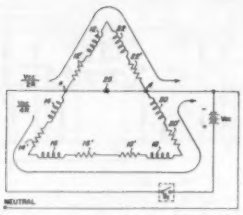
1. An apparatus for a machine tool for the automatic generation of a switching signal and for reducing the speed of a tool from the advance feed stroke into the work stroke upon approach of the tool at a workpiece, the improvement comprising: mechanism for accelerating the tool in a direction opposite said feed stroke, means for producing a switching signal for electrically actuating said mechanism when the tool approaches said workpiece, said producing means including an electrical current circuit, the machine tool constituting part of said electrical current circuit, the impedance change of said circuit, upon contact of the workpiece by the tool, triggering said switching signal.

3,975,668

DYNAMIC BRAKING FOR A THREE PHASE MOTOR

Walter C. Davie, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1972, Ser. No. 291,853
Int. Cl.² H02P 3/20
U.S. Cl. 318—212 4 Claims



1. Apparatus for dynamically braking a motor operable from a source of three-phase current comprising:

a motor stator section whose windings are connected in a delta configuration, each side of the delta comprising at least two windings connected at a center tap, said three-phase current being applied to the delta terminal points,

a source of d.c. current, and

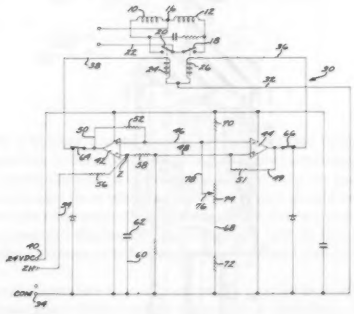
switch means for connecting said source of d.c. current between two of said center taps of said delta configuration when the three-phase current source is removed from the delta terminal points whereby said motor is dynamically braked.

3,975,669

ELECTRONIC DAMPER MOTOR CONTROL

Hugh Jean Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 18, 1974, Ser. No. 524,532
Int. Cl.² G05B 5/01
U.S. Cl. 318—624 7 Claims



1. A control circuit comprising a pair of operational amplifiers with a common voltage power supply connected to ground and voltage supply terminals thereof, said operational amplifier having inverting and non-inverting input terminals cross-connected by first and second cross conductors, input means to each of said conductors comprising input signal circuit

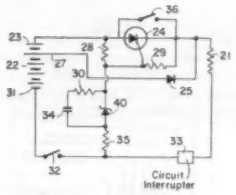
means in circuit to the first of said cross conductors, reference signal circuit means in circuit to the second of said cross conductors, dead band means for discriminating input error signals of predetermined magnitude comprising resistance means in one of said cross conductors between one of said input terminals of said operational amplifiers and its respective input means, and voltage feedback circuit means connected between the output and non-inverting terminals of each of said operational amplifiers.

3,975,670

OVERVOLTAGE PROTECTOR FOR BATTERY OPERATED DEVICES

Julian A. McDermott, 1639 Stephen St., Brooklyn, N.Y. 11327

Filed May 2, 1973, Ser. No. 356,504
Int. Cl.² H02J 7/00; G05F 3/08
U.S. Cl. 320—13 **7 Claims**



1. In combination a battery comprising a plurality of cells, a load terminal, a blocking diode connected between a tap on one of said cells below the full voltage point of the battery and said load terminal, voltage sensing circuitry and silicon controlled rectifier switching means responsive thereto to cause conduction from a higher voltage battery tap to the load terminal instead of from the lower voltage tap when the battery voltage falls below a predetermined value, current control means to intermittently reduce the current through said silicon controlled rectifier below its holding value.

3,975,671

CAPACITIVE VOLTAGE CONVERTER EMPLOYING CMOS SWITCHES

Peter A. Stoll, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 24, 1975, Ser. No. 552,439
Int. Cl.² H02M 3/06
U.S. Cl. 321—15 **7 Claims**

4. A CMOS integrated circuit disposed on a substrate of a first conductivity type for charging a capacitor from a source of potential, and for coupling said capacitor in series with said source of potential to provide a higher potential than said source of potential, said source of potential including a first and second potential terminal and said capacitor including a first and second capacitor terminal, comprising:

a first transistor disposed on said substrate, said first transistor including a pair of regions of a second conductivity type, one of said regions coupled to said first potential terminals and the other of said regions coupled to said first capacitor terminal;

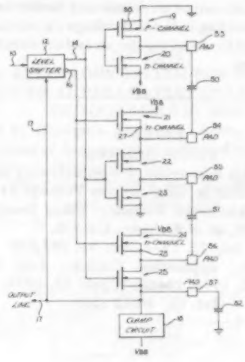
a first p-well, said first p-well coupled to said second potential terminal;

a second transistor disposed in said first p-well said second transistor including a pair of regions of said first conductivity type, one of said regions coupled to said first capacitor terminal and the other of said regions coupled to said second potential terminal;

a second p-well disposed in said substrate, said second p-well coupled to said second capacitor terminal;

a third transistor disposed in said second p-well, said third transistor including a pair of regions of said first conductivity type, one of said regions coupled to said second potential terminal and the other of said regions coupled to said second capacitor terminal;

a fourth transistor disposed on said substrate, said fourth transistor including a pair of regions of said first conductivity type, one of said regions coupled to said second capacitor terminal;



a fifth transistor disposed on said substrate, said fifth transistor including a pair of regions of said second conductivity type, one of said regions coupled to said first potential terminal and the other of said regions providing a common terminal with said other region of said fourth transistor;

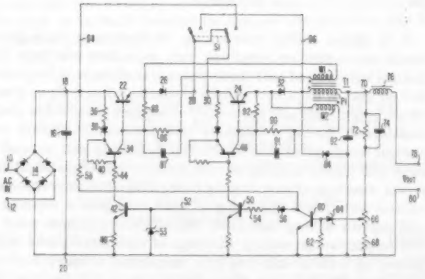
whereby said capacitor may be charged from said source of potential and then coupled in series with said source of potential to provide a higher potential at said common terminal.

3,975,672

POWER SUPPLY WITH MEANS TO REDUCE ON AND OFF SWITCHING TIMES OF SERIES REGULATED DEVICE

Eugene Lachocki, Turnersville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,097
Int. Cl.² G05F 1/56, 1/64
U.S. Cl. 323—17 **12 Claims**



1. A power supply for providing a regulated voltage at a pair of output terminals, said power supply comprising:

a pair of input terminals adapted for connection to a source of unregulated voltage;

a plurality of series connected regulating devices connected in circuit with one of said input terminals, said regulating

devices being simultaneously operated to switch between an on and an off state of current conduction;

first means connected between said pair of output terminals and said plurality of regulating devices for simultaneously controlling the state of current conduction of said plurality of regulating devices for providing a predetermined voltage at said pair of output terminals; and second means connected between said plurality of regulating devices and one of said output terminals and further comprising means for providing individual voltage signals to each one of said devices for reducing the on and off switching times of said devices.

3,975,673

PHASE SHIFTER

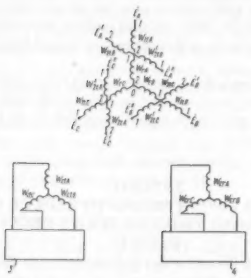
Valery Anatolievich Boshnyaga, 1 Kostjuzhensky pereulok 1; Lev Pavlovich Kalinin, ulitsa Stefana Velikogo 51-a, kv. 35, and Vitaly Mikhailovich Postolaty, ulitsa Demokraticheskaya 6/1, kv. 58, all of Kishinev, U.S.S.R.

Filed July 21, 1975, Ser. No. 597,890

Claims priority, application U.S.S.R., July 22, 1974, 2048090; July 22, 1974, 2048091; July 22, 1974, 2048089

Int. Cl.² H02J 3/00

U.S. Cl. 323—119 9 Claims



1. A phase shifter comprising: at least one three-phase transformer; primary windings, two secondary windings and control windings of said three-phase transformer; a beginning and an end of each said primary winding of said three-phase transformer; both said secondary windings of said three-phase transformer having a common point; a reactor; power and control windings of said reactor; a beginning and an end of each said power winding of said reactor; said ends of all said power windings of said reactor being connected to a common neutral point; said beginning of each said power winding of said reactor having connected thereto said common point of two respective secondary windings of said three-phase transformer as well as said end of a respective primary winding, thus providing for two three-phase output voltage sets; the phase of the voltages across said two secondary windings of said three-phase transformer differing from that of the voltage across said power winding of said reactor; switching devices for setting the required phase angle between said three-phase output voltage sets; said control windings of said three-phase transformer and reactor being connected to respective switching devices.

3,975,674

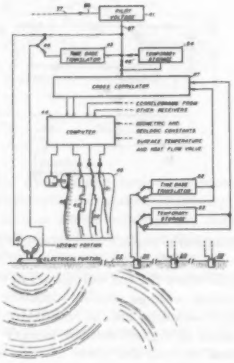
GEOTHERMAL EXPLORATION METHOD UTILIZING ELECTRICAL RESISTIVITY AND SEISMIC VELOCITY

Robert B. McEuen, 5202 College Gardens Court, San Diego, Calif. 92115

Filed Sept. 29, 1972, Ser. No. 293,480

Int. Cl.² G01V 3/00, 11/00

U.S. Cl. 324—1 9 Claims



1. A method for locating and characterizing subterranean layers comprising the steps of:

a. detecting at several locations on the earth's surface a first set of outputs which are proportional to the amplitudes of the reflected seismic waves generated by a combined seismic wave and electrical current source while simultaneously detecting at the same locations a second set of outputs proportional to the voltage induced in the ground by the current produced at the seismic wave and electrical current source, and while simultaneously recording the pilot voltage used to generate the seismic and electrical current pulses, at the combined source, said pilot voltage being identical in form and proportional to both the source's seismic pulse and the source's electrical pulse;

b. processing in a multi channel cross-correlator the pilot voltage and the first and second set of outputs using the pilot voltage as the noise free reference signal, so as to obtain accurate values for the seismic wave arrival times, the amplitudes of these seismic arrivals and accurate values of the induced voltages and the relative time delays of these voltages;

c. computer processing the outputs of the cross-correlator which contain the reflection arrival times to obtain the seismic velocity V_n for all layers by automatically solving the equation

$$V_n = \left\{ \frac{x^2}{2[t_n(0) - t_{n-1}(0)]} \left(\frac{1}{\Delta t_n} - \frac{1}{\Delta t_{n-1}} \right) \right\}^{1/2}$$

in which $t_n(0)$ and $t_{n-1}(0)$ are respectively the arrival time at $x = 0$ from the bottom and top of the nth layer and in which Δt_n and Δt_{n-1} are respectively the difference in arrival time between x=0 and x=x for the reflection from the bottom and the top of the nth layer, the variable x in said equation being known and input to the computer;

d. computer processing of the outputs of the cross-correlator which contain the induced voltage values to obtain for all layers the value of bulk rock resistivity, ρ_r, determined from the n-layer equivalent of the half space solution

$$\rho_n = \frac{2\pi\Delta v}{I\left(\frac{1}{x_n} - \frac{1}{x_{n+1}}\right)}$$

in which $\Delta\mu$ is the potential difference created by the injection of current I as measured between electrodes located at distances x_n and x_{n+1} from the surface current pole, said values of ρ_r being those which best bring into accord in the least squares sense the seismically determined sequence of layers, Σh_n, given by

$$\sum_{n=0}^{N} h_n = \sum_{n=0}^{N} V_n \quad (t_n(o) - t_{n-1}(0))$$

where the quantities are those defined in step c, and the measured induced voltage values, this accord being brought about by the fact that there is only one sequence of ρ_r values possible for the measured induced voltages once the sequence of thicknesses has been seismically established;

e. computer processing the values of layer resistivity, ρ_r, in conjunction with values of layer seismic velocity, V, to determine the pore fluid resitivity, ρ_w, through solution of the relation

$$\rho_w = \frac{\rho_r}{a} \quad \left(\frac{1}{V} - b\right)$$

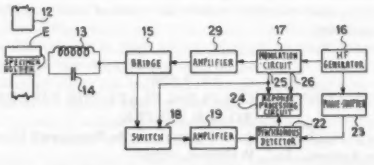
in which a and b are constants determined for the area undergoing exploration.

3,975,675

IMPULSE RESPONSE MAGNETIC RESONANCE SPECTROMETER

Jean-Jacques Dunand, and Jean Delayre, both of Courbevoie, France, assignors to Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.-E.C.A.), Paris, France

Filed Jan. 31, 1975, Ser. No. 546,082
Claims priority, application France, Feb. 5, 1974, 74.03781
Int. Cl.² G01R *33/08*
U.S. Cl. 324—.5 A **7 Claims**



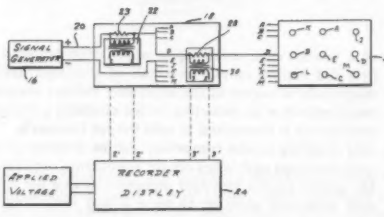
1. A magnetic resonance spectrometer for operating with inpulse response, said spectrometer comprising: first means for the magnetic polarization of a specimen; second means for generating excitation signals having a period of recurrence T_r, and a duration T_0 shorter than T_r, said second means including a high-frequency oscillator, and a modulating circuit for both amplitude modulating and frequency modulating, with said period T_r, the output signal from said oscillator, so that each of said excitation signals be formed by at least one train of linearly frequency modulated oscillations; and detecting means for detecting the impulse response of said specimen to each of said excitation signals.

3,975,676

PLURAL ELECTRODE SYSTEM FOR DETERMINING THE ELECTRICAL PARAMETERS OF LARGE SAMPLES OF MATERIALS IN SITU

Emmanuel E. Bliamptis, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,405
Int. Cl.² G01V *3/06*
U.S. Cl. 324—9 **2 Claims**



1. A system for determining irregularities in large geophysical samples comprising: a frequency signal generator; a plurality of linear cylindrically shaped electrodes, adapted to be positioned within the sample and in electrical contact therewith, said electrodes each including a plurality of electrically independent segments, mechanically connected along a common longitudinal axis; a junction box means connecting the frequency signal generator and each said segment of each electrode, wherein a certain designated number of electrodes and segments receive a positive signal from said frequency signal generator and a certain designated number of electrodes and segments receive a negative signal from said frequency signal generator, and periodically varying voltages of different frequencies may be applied to each segment; a recording-display means and sampling resistors positioned in the circuit between said frequency signal generator and said electrodes and connected to the recording-display means whereby changes in current created by sample irregularities will be recorded and displayed.

3,975,677

METHOD AND APPARATUS FOR TESTING AN INDUCTIVE DEVICE FOR THE PRESENCE OF A VOLTAGE SUPPRESSOR

Charles C. Hancock, Salem, Va., assignor to General Electric Company, New York, N.Y.

Filed Jan. 14, 1975, Ser. No. 540,893
Int. Cl.² G01R *31/02*
U.S. Cl. 324—28 **5 Claims**

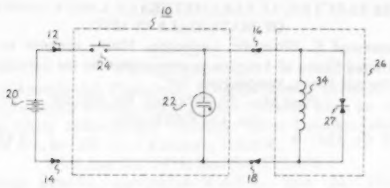
1. Apparatus for testing an inductive device for the presence of a voltage suppressor of the type adapted to limit the maximum amplitude of voltage transients generated by the inductance of said device responsive to the modification of the electrical energization of said device, said apparatus comprising:

a. first and second input terminals adapted to connect said apparatus to a DC power source of predetermined potential;

b. first and second output terminals adapted to connect said apparatus to said inductive device;

c. coupling circuit means for coupling said first input terminal to said first output terminal and said second input terminal to said second output terminal to provide a series circuit connection between said DC power source and said inductive device;

d. a voltage responsive indicating element adapted to have discrete first and second indicating states connected in circuit between said first and second output terminals, said element being selected to provide a sensory output



of a second state solely upon application between said first and second output terminals of a voltage having a magnitude in excess of the maximum voltage magnitude produced when an inductive device containing a suppression device is connected to said output terminals;

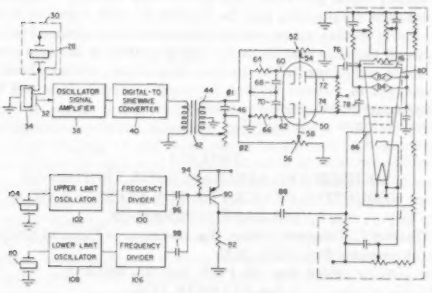
e. said coupling means comprising means adapted to cyclically interrupt said series circuit connection between said DC power source and said inductive device for causing said indicating element to have a first indicating state when said device includes a voltage suppressor and a second indicating state when said device does not include a voltage suppressor.

3,975,678

CRYSTAL RANGING APPARATUS FOR DETERMINING RANGE WITHIN WHICH RESONANT FREQUENCY OF CRYSTAL LIES

Bruce G. Erickson, Santa Clara, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed May 19, 1975, Ser. No. 578,608
Int. Cl.² G01R 29/22, 23/02
U.S. Cl. 324—56 **8 Claims**



1. Vibrating crystal testing apparatus providing a visual indication that the resonant frequency of an oscillating piezoelectric crystal undergoing testing lies within a predetermined narrow frequency range of less than one octave, including in combination:

crystal oscillator means connected to a said crystal for generating a crystal signal therefrom corresponding to the resonant frequency thereof;

upper limit reference generator means for generating a signal corresponding to an upper limit of said range;

lower limit reference generator means for generating a signal corresponding to a lower limit of said range;

visual display means for displaying two moving visual elements and including visual display drive means connected to said crystal oscillator means, said upper limit reference generator means and said lower limit reference generator means, said display drive means for providing one of said elements moving in a first direction in accordance with the change in phase relationship between the said crystal and said upper limit reference signal, and for providing the other element moving in a second direction in accordance with the change in phase relationship between said crystal signal and said lower limit reference signal,

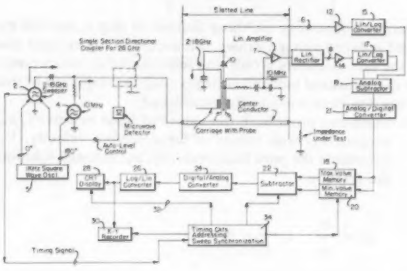
whereby when said first direction is counter to said second directon said resonant frequency is thereby determined to be within said range and when said first direction is the same as said second direction said resonant frequency is thereby determined to be outside said range.

3,975,679

DIRECT-READING SWEPT-FREQUENCY SLOTTED LINE SYSTEM WITH SLOPE CORRECTION

Fritz K. Weinert; Bruno O. Weinschel, and Donald Woodruff, all of Gaithersburg, Md., assignors to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Filed June 16, 1975, Ser. No. 587,389
Int. Cl.² G01R 27/04
U.S. Cl. 324—58.5 B **8 Claims**



1. System for producing a direct VSWR reading over a continuous range of frequencies, comprising

a. a measurement slotted line having a slidable test probe and detector, and means for connecting the slotted line to a unit to be tested,

b. RF sweep generator means connected to said slotted line for repeatedly supplying said slotted line with electrical energy over said range of frequencies at a repetition rate such that substantially the entire said range of frequencies is swept through at closely spaced successive positions as the probe is moved along the slot,

c. means for respectively storing maximum and minimum values picked up by the probe at each of said frequencies as the probe is moved along the slot, and

d. means for displaying the difference between said maximum and minimum values for each of said specific frequencies.

3,975,680

NON-CONTACT COUPLING PLATE FOR CIRCUIT BOARD TESTER

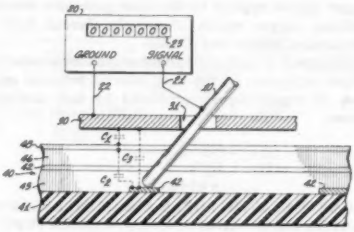
Larry J. Webb, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 25, 1975, Ser. No. 590,356
Int. Cl.² G01R 27/02
U.S. Cl. 324—61 P **6 Claims**

1. In an apparatus for testing the electrical integrity of a circuit run in a circuit board, wherein said apparatus com-

prises probe means for electrically contacting said circuit run and means connected to said probe means for measuring the capacitance of said circuit run, the improvement therein comprising

an electrically conductive plate connected to said capacitance measuring means, and



means for holding said plate co-planar with and in close proximity to said circuit board,

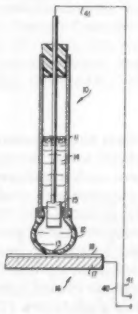
whereby said probe means, said circuit run, and said plate comprise an electric circuit whose capacitance, as measured by said capacitance measuring means, is a function of the electrical integrity of said circuit run.

3,975,681

ELECTRODE FOR MEASURING THICKNESS OF DIELECTRIC LAYERS ON CONDUCTIVE SUBSTRATES

Dominic J. Angelini, and Philip G. Perry, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1975, Ser. No. 540,226
Int. Cl.² G01N *27/02, 27/26*
U.S. Cl. 324—71 R **16 Claims**



1. An electrode structure consisting essentially of:

a hollow tube of substantially electrically insulating material;

a tip portion of substantially electrically insulating material closing one end of said tube, with a capillary orifice with a diameter less than about 1/16 of an inch extending through the thickness of said tip portion;

a piece of electrode material extending into said tube from the end opposite said tip portion;

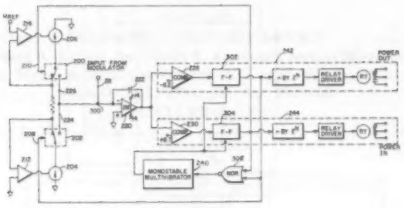
an electrolyte which is nondestructive to a layer the thickness of which is to be measured and selected from the group consisting of tartaric acid, isopropyl alcohol, sodium formate, sodium chloride, potassium iodide, other halides of light metals and mixtures thereof within said tube and said tip portion, with the piece of electrode material extending into said electrolyte.

3,975,682

WATT/WATTHOUR TRANSDUCER AND INTEGRATOR AND CURRENT SOURCES THEREFOR

Glenn A. Mayfield, Columbus, Ohio, assignor to Esterline Corporation, New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,530
Int. Cl.² G01R *21/00*
U.S. Cl. 324—142 **5 Claims**



2. An electrical power line watthour metering apparatus of the type including a pair of watt related signal terminals providing a signal which is directly proportional to the instantaneous power of said power line and an integrator-quantizer means for integrating said watt signal over a selected period of time for providing an output signal corresponding to watthours of energy through said power line, wherein the improvement comprises a bi-directional integrator-quantizer comprising;

a. a commonly referenced bipolar current source for supplying a current pulse having a selected standard magnitude and in either one of two opposite current flow directions, said bipolar current source including a switching means for selectively switching said current source to a first state supplying no current, to a second state supplying a pulse in one current flow direction and a third state supplying a pulse in the opposite current flow direction;

b. an integrating circuit means having an input connected to said watt signal terminals for integrating said watt related signal with respect to time by accumulating charge and also having its input connected to the output of said bipolar current source;

c. a pair of comparators each having one of its inputs connected to the output of said integrating circuit means, one of said comparators referenced to a first voltage for switching its output from a first state to a second state when the output of the integrating circuit means reaches a selected positive output voltage and the other of said comparators referenced to a second voltage for switching its output from a first state to a second state when the output of the integrating circuit means reaches a selected negative voltage; and

d. logic and timing circuit means having a pair of inputs connected to the outputs of said comparators and connected at its output to the switching means of said bipolar current source for switching said current source to its first state when both of said comparators are in their first state, and for switching the switching means for a precise selected time period to whichever one of its second or third states provides a current which reduces the accumulated charge of said integrating circuit means and thereby reduces the output voltage of said integrating circuit means.

3,975,683
IN-CIRCUIT DIODE TESTER

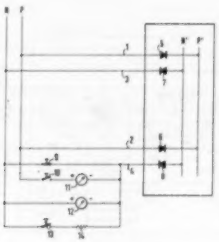
Dieter Behrens, and Heinz Klotzsche, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 22, 1974, Ser. No. 499,777

Claims priority, application Germany, Aug. 31, 1973, 2344015

Int. Cl.² G01R *31/22*

U.S. Cl. 324—158 D **9 Claims**



1. An arrangement for testing diodes interposed in parallel feed lines between the terminals of a d.c. voltage source and corresponding d.c. bus bars which comprises:

a. a first switching means positioned between a first side of the diode to be tested and a terminal of said voltage source of first polarity;

b. a second switching means connected to the terminal of said voltage source of opposite polarity; and

c. current measuring means connecting said second switching means to said first side of the diode to be tested, said current measuring means adapted to monitor the cut-off current flowing through said diode to be tested when said first switching means is opened and said second switching means is closed.

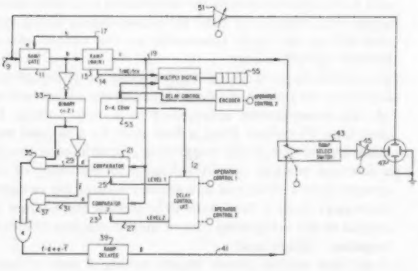
3,975,684
SWEEP GENERATOR APPARATUS AND METHOD

William J. Mordan, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 11, 1974, Ser. No. 505,186

Int. Cl.² G04F *8/00*

U.S. Cl. 324—185 **11 Claims**



1. Electronic circuit apparatus comprising:

main generator means which responds to a trigger signal applied thereto for producing an output signal which varies monotonically with time;

a plurality of comparator means, each having an input connected to receive said output signal from said main generator means for comparison with a signal applied to another input thereof, each of said comparator means producing a trigger signal in response to the signals applied to the inputs thereof attaining a predetermined relationship;

means coupled to each said another input of said comparator means for applying signals thereto;

delayed sweep generator means for producing a sweep signal in response to a trigger signal applied thereto;

circuit means coupled to said comparator means and to said delayed sweep generator means and responsive to the trigger signals applied to the main generator means for applying trigger signals alternately thereto from said comparator means; and

means coupled to said comparator means for producing an output indication of the time interval between appearance of trigger signals produced by said comparator means.

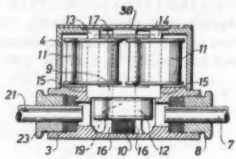
3,975,685
MAGNETOELASTIC SHEAR FORCE MEASURING MEANS FOR MEASURING SHEAR STRESS IN TUBULAR AXLES

Nils-Ove Bielsten; Orvar Dahle; Ronald Grek; Lars-Erik Lindback; Sture Siby, and Ake Widehn, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 30, 1975, Ser. No. 545,626

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 ST **5 Claims**

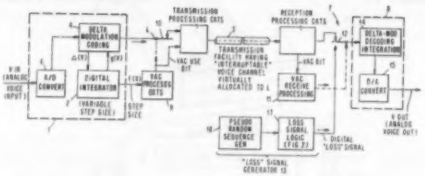


1. Magnetoelastic shear stress measuring means for measuring shear stress in tubular axles, comprising first and second shear stress transducers, each transducer having two basically U-shaped iron cores provided with windings, said cores being oriented perpendicular to each other, the first of said cores to be excited by alternating current to generate a magnetic field in a measuring object located in front of the core poles, whereas the second of said cores with its winding is arranged to sense the field alterations caused in the measuring object by shear stresses, the two transducers (2) being combined to form a measuring unit, said measuring unit including means engageable with the inside of the axle when the unit is inserted in the axle (1) to a suitable measuring position, the two transducers having a common axis of symmetry and a slide arrangement holding the transducers together for permitting alteration of the distance between the two transducers along said axis of symmetry, said slide arrangement comprising a spring device which presses the transducers away from each other towards the inner surface of the axle, thus retaining the shear force measuring means in the desired position in the tubular axle, each transducer comprising a housing (3) having a lid (4), both the housing and the lid being of non-magnetic material, the part of the housing facing the inner surface of the axle and the surface of the axle being arranged in insulated relation to each other, at least in the vicinity of the pole surfaces in order to eliminate unstable eddy currents, which would otherwise randomly disturb the balance of the transducer.

3,975,686
LOSS SIGNAL GENERATION FOR DELTA-MODULATED SIGNALS

Ulrich Appel, Munich, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,422
Int. Cl.[2] H03K 13/22
U.S. Cl. 325—38 B 13 Claims



1. In combination:

a first source of delta-modulation coded serially recurrent digital signals representing audibly reproducible sound effects having intelligibility distinct from noise;

a second source of delta modulation coded serially recurrent digital signals useful upon demodulation to produce audible "weak" noise effects distinct from "dead silence;" said noise signals having a pseudo-random pattern of bits subject to a predetermined constraint imposed upon the number of equal-valued bit elements which can occur consecutively;

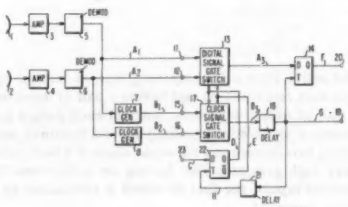
a delta-modulation decoding circuit for converting delta modulation code to signals to audible sound signals; and

means for selectively coupling said decoding circuit to receive signals from said first and second sources.

3,975,687
BASEBAND SIGNAL SWITCHING ARRANGEMENT FOR DIVERSITY RECEPTION IN PCM RADIO COMMUNICATION SYSTEM

Yoichi Tan, and Hiromi Hashimoto, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 25, 1975, Ser. No. 607,722
Claims priority, application Japan, Aug. 24, 1974, 49-97163
Int. Cl.[2] H04B 7/08
U.S. Cl. 325—304 4 Claims



1. In a diversity reception digital communication system including means for receiving a plurality of carrier waves modulated with identical digital signals and propagated through respective propagation paths, means for demodulating the received carrier waves into a plurality of baseband digital signals, and clock signal regenerating means responsive to the outputs of said demodulating means for extracting a plurality of clock signals from said baseband digital signals, the improvement in a baseband signal switching arrangement comprising:

a digital signal gate switch connected to receive the outputs of said demodulating means for selecting one of said plurality of baseband digital signals,

a clock signal gate switch connected to receive the outputs of said clock signal regenerating means for selecting one of said plurality of clock signals corresponding to the selected baseband digital signals,

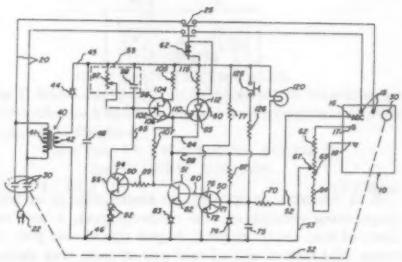
a delay circuit for delaying the clock signal selected by said clock signal gate switch and

a control signal read-out circuit connected to receive the output of said delay circuit to read-out a switching control signal separately fed to said control signal read-out circuit so that said digital signal gate switch and said clock signal gate switch are controlled simultaneously by the output of said control signal read-out circuit.

3,975,688
TELEVISION SHUT-OFF DEVICE

Richard A. Kroger, and Larry E. Anderson, both of Minneapolis, Minn., assignors to Richard A. Kroger, Fridley, Minn.

Filed Oct. 21, 1971, Ser. No. 191,418
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—392 5 Claims



1. A television shut-off device comprising; a television set for receiving and transforming a plurality of electromagnetic signals to corresponding television channel video and audio signals and having an AGC circuit and a bias supply therein, an AC power supply for supplying power to the television set for reception and transformation of said channel signals, circuit means connecting the power supply to the television set and including switch means for opening and closing the circuit means to control energization of the television set from the power supply, detector circuit means connected to the AGC circuit of the television set and bias supply in the television set and including electromagnet means connected to and operating the switch means in the circuit means for the opening and closing of the circuit means from the power supply to the television set, said detector circuit means including means for selectively detecting the presence of a signal indicative of the presence and absence of a video signal in the television set through comparison of a voltage in the AGC circuit and the bias supply, said signal detecting means including a two stage amplifying switching device responsive to the differential between the reference level signal and the AGC signal and in which one stage is energized with the presence of the video signal and the other stage is energized with the absence of a video signal in the television set, timer means included in the detector circuit means connected to and responsive to the means selectively detecting the presence of a signal indicative of the absence of a video signal and providing a pulsed output signal therefrom at the end of a predetermined period of time, said timer means including an RC network, a unijunction transistor, and an additional transistor, the RC network upon discharge controlling the firing of the unijunction transistor to provide the pulsed output signal to the switch means, said additional transistor being connected to said amplifying means and responsive to the signal indicative of the absence of video signal in the television set to become operative to control the discharge of the capacitive component of the RC network connected to the unijunction transistor to control firing the same, switching means having two conditions of operation

connected to the timing means to be operated to one condition of operation with the pulsed output signal from the timing means, and means connecting the switching means to the electromagnetic means in the detector circuit for opening the circuit means connecting to the television set from the power supply under the presence of said one condition of operation of the switching means.

3,975,689

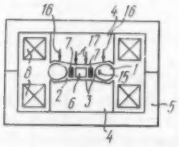
BETATRON INCLUDING ELECTROMAGNET STRUCTURE AND ENERGIZING CIRCUIT THEREFOR

Alfred Albertovich Geizer, ulitsa Nikitina, 4, kv. 4-8, and Vladimir Lukyanovich Chakhlov, pereulok Zavodskoi, 8/1, kv. 6, both of Tomsk, U.S.S.R.

Continuation of Ser. No. 445,997, Feb. 26, 1974, abandoned. This application Feb. 4, 1975, Ser. No. 546,940

Int. Cl.² H05H *7/04, 11/00*

U.S. Cl. 328—237 **10 Claims**



1. A betatron, comprising: an electromagnet; at least one magnetizing winding of said electromagnet; a pair of pole cores of said electromagnet; shaped tips of said pair of pole cores; said shaped tips of said pair of pole core defining at least one gap therebetween; a toroidal vacuum accelerating chamber disposed interiorly of said gap; at least one bias winding likewise disposed interiorly of said gap and adapted to change the field distribution within said gap, said bias winding being connected in series with said magnetizing winding; a current pulse generator operating into said magnetizing and bias windings; an energy accumulator of said current pulse generator; switching elements of said current pulse generator, said windings being coupled to said energy accumulator; additional switching elements of said current pulse generator which return the energy stored by said electromagnet to said accumulator, said additional switching elements being connected to said magnetizing winding of said generator.

3,975,690

PLANAR TRANSMISSION LINE COMPRISING A MATERIAL HAVING NEGATIVE DIFFERENTIAL CONDUCTIVITY

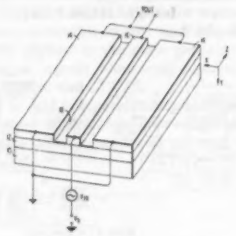
Paul L. Fleming, Rockville, Md., assignor to Communicatons Satellite Corporation (Comsat), Washington, D.C.

Continuation-in-part of Ser. No. 512,574, Oct. 7, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,657

Int. Cl.² H03F *3/04*

U.S. Cl. 330—5 **12 Claims**

1. A planar transmission line amplifier comprising; a Gunn semiconductor layer selected from the group consisting of gallium arsepide, indium phosphide, zinc telluride, cacmium telluride, indium arsenide under mechanical stress, and germanium at temperatures below 17°K, said layer consisting of a substrate portion and an epitaxial portion, said epitaxial portion having a dopant concentration, n, from a surface of said epitaxial layer down to approximately 4 μm from said surface and sharply decreases thereafter; at least two conductive plates ohmically contacting said epitaxial surface and being spaced to form a gap of width L therebetween, whereby the product $n \cdot L$ is less than 1×10^{12} atoms/cm^2; an input port consisting of the first adjacent ends of said conductive plates, and output port consisting of the second, opposite, ends of said conductive plates; means for applying a voltage between said two conductive plates equal to a value sufficient to create an E field in the surface of said gap equal to approximately



twice the Gunn threshold of said semiconductor layer; and means for applying an r.f. signal to said input port to cause said r.f. signal to propagate in a direction perpendicular to said E field vector.

3,975,691

ACTIVE FREQUENCY FILTER CELLS

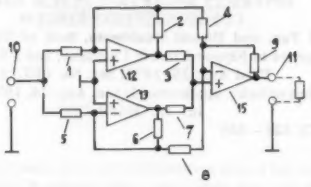
Pierre Thepaut, Lannion, France, assignor to Lignes Telegraphiques et Telephoniques, Paris, France

Filed June 20, 1975, Ser. No. 588,814

Claims priority, application France, July 30, 1974, 74.26408

Int. Cl.² H03F *1/36*

U.S. Cl. 330—107 **5 Claims**



1. An active filter cell comprising dipoles formed by means of capacitors and resistors and having a pair of input terminals and a pair of output terminals, with, in each pair, a grounded first terminal and a non-grounded second terminal, and which comprises two elementary networks each of which including:

a very high-gain amplifier having an output and first and second inputs, the first of which is connected to a reference potential;

a first dipole connected between said second input terminal of the cell and said second input of said amplifier;

a second dipole connected between said second input of said amplifier and said output of said amplifier; and

a third dipole connecting said output of said amplifier to a common terminal to both said networks;

said cell further comprising:

a third high-gain amplifier of the differential type having a negative input and a positive input, said negative input being connected through a fourth dipole to the non-grounded input of one of the amplifiers of said networks, and by means of a further connection to the output of said third amplifier, and said positive input being connected to said common terminal.

3,975,692

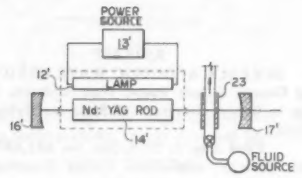
CONTROL OF LASER OUTPUT CHARACTERISTICS BY FLUID STREAMS

Alexander Mego, Jr., Pittsburgh, and John D. Feichtner, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 376,851, July 5, 1973, abandoned. This application Feb. 28, 1975, Ser. No. 554,273

Int. Cl.² H01S *3/10*

U.S. Cl. 331—94.5 M **15 Claims**



1. A method for modulating a laser output, said method comprising:

selectively transecting the optical axis of the laser with a fluid stream,

said stream having a plurality of refractive index gradients thereacross, and

said stream flowing such that said gradients are changing with time.

3,975,693

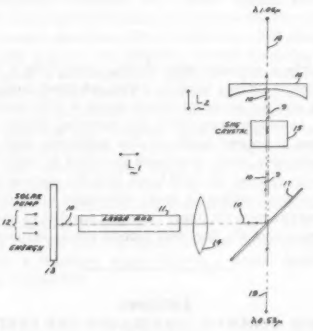
DUAL FUNCTION LASER FOR SPACE LASER COMMUNICATIONS

James D. Barry, Fairborn, and Paul M. Freedman, WPAFB, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1975, Ser. No. 556,989

Int. Cl.² H01S *3/081*

U.S. Cl. 331—94.5 C **1 Claim**



1. A dual function laser system providing a first laser beam radiation at a first wavelength and a second laser beam radiation radiating in the opposite direction from the said first beam and at a second wavelength that is approximately one-half the said first wavelength, comprising:

a. an optical cavity resonant at the said first wavelength having a first leg, and an intersecting second leg positioned substantially at a right angle to the said first leg, the said optical cavity having a flat mirror highly reflective to the said first wavelength and highly transmissive to the said radiation of the said second wavelength positioned at approximately 45° to each of the said legs at their said intersection, the said flat mirror optically connecting the said first leg and the said second leg to form the said resonant cavity;

b. a laser rod element positioned in the said first leg of the said optical cavity, stimulated to provide laser emission circulating in the said resonant cavity at the said first wavelength;

c. a frequency doubling crystal positioned in the said second leg of the said optical cavity intercepting the said circulating laser emission at the said first wavelength, the said crystal generating from the said circulating emission the said second laser beam having the said second wavelength that is half the said first wavelength, whereby the said second laser beam is coincident with the said first laser emission in the said second leg of the said optical cavity and propogates through the said flat mirror; and

d. means for extracting from the said second leg of the said optical cavity laser radiation at the said first wavelength propogating in the opposite direction from the said propogating second wavelength radiation.

3,975,694

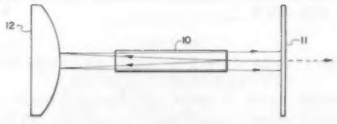
SELF Q-SWITCHED LASER

Nathan T. Melamed, Pittsburgh, and Kenneth B. Steinbruegge, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,888

Int. Cl.² H01S *3/10, 3/08*

U.S. Cl. 331—94.5 Q **12 Claims**



1. In a self Q-switched solid state laser oscillator system in which the intracavity laser beam is in the form of a small cross sectional area beam, said oscillator comprising a pair of resonator elements, the improvement comprising a diffusing means for scattering/diverging the intracavity laser energy to increase the effective volume of the laser rod which is self Q-switched and, thereby, contributing to laser emission.

3,975,695

WAVEGUIDE BEYOND CUTOFF COUPLER FOR COUPLING TO RESONANT CAVITY

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

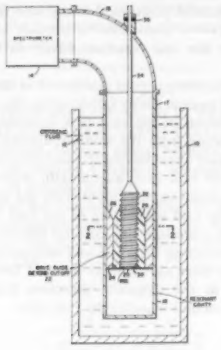
Filed June 10, 1975, Ser. No. 585,913

Int. Cl.² H01P *5/04*

U.S. Cl. 333—24 R **3 Claims**

1. A waveguide beyond cutoff coupler for connecting a microwave source into a resonant cavity said coupler comprising: a waveguide section adapted to be connected between said microwave source and said resonant cavity; a hollow brass section provided with an outwardly tapered top disposed within said waveguide section; a hollow dielectric body disposed within said section, said body having threads on its internal wall; a tuning slug disposed inside of said body and

having external threads thereon for a rotary connection with said body and a rod connected to said tuning slug for controlling the rotary movement of said slug and thereby the amount of source energy coupling to said resonant cavity.



3,975,696

ACOUSTIC STORAGE DEVICE FOR THE CORRELATION IN PARTICULAR OF TWO HIGH FREQUENCY SIGNALS

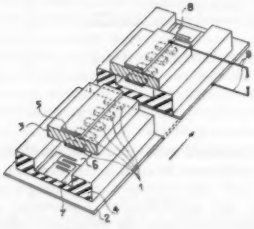
Gerard Kantorowicz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 29, 1975, Ser. No. 581,749

Claims priority, application France, June 4, 1974, 74.19172

Int. Cl.² H03H *9/26, 9/30;* **G06G** *7/19;* **H01L** *41/10*

U.S. Cl. 333—30 R **9 Claims**



1. An acoustic device for high frequency signals, constituted by a network of cells each made up of a capacitor and a semiconductor diode in series with one another, said diode being formed by an insulated electrode applied to one of the faces of a semiconductor and placed between two electrodes the first of which is applied directly on that face of said semiconductor which is opposite to the one on which the insulated electrode is applied, and the second of which is applied to a layer of an electrically insulating material arranged opposite said insulated electrode and opposite that face of said semiconductor to which said electrode is applied, said insulated electrode and said second electrode constituting the electrodes of said capacitor, said acoustic device being characterised in that it furthermore comprises a piezoelectric body and transducers applied to one of the faces thereof, from which transducers acoustic surface waves propagate when high frequency signals are applied to their terminals; in that said insulated electrodes of said network of diodes are distributed in the direction of propagation of said surface acoustic waves generated by said transducers at the face of said piezoelectric body; and in that said acoustic device comprises means for coupling that face of said piezoelectric body on which said acoustic waves propagate, to said insulated electrodes of said diodes of the network, as well as means for successively connecting between said first and second electrodes after the appearance of a first high frequency signal at one of said transducers, a source of voltage pulses which charge up said capacitors, and a load, said device ensuring that there is picked off across said load, during the whole of the time of the discharge of said capacitors, a signal resulting from the superimposition of the first signal and a second signal applied to one of said transducers after the application of said pulse.

3,975,697

SURFACE ACOUSTIC WAVE DEVICES

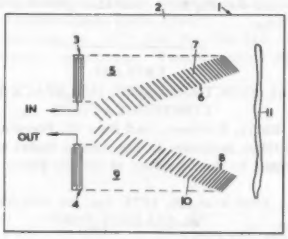
Edward George Sydney Paige, West Malvern, England, assignor to British Secretary of State for Defence, London, England

Filed Aug. 1, 1975, Ser. No. 601,687

Claims priority, application United Kingdom, Aug. 16, 1974, 36289/74

Int. Cl.² H03H *9/26, 9/30, 9/32;* **H01L** *41/18*

U.S. Cl. 333—30 R **15 Claims**



1. A surface acoustic wave device comprising a substrate able to support surface acoustic waves, an input transducer for launching surface acoustic waves along a first track on the substrate, an output transducer for receiving surface acoustic waves from a second track on the substrate, and first and second reflective array structures arranged to reflect surface acoustic waves from the first track into the second track, the first and second reflective array structures each comprising numerous reflecting elements arranged parallel to one another in echalon across the first and second tracks respectively.

3,975,698

FIBER ACOUSTIC WAVEGUIDE AND SYSTEM

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

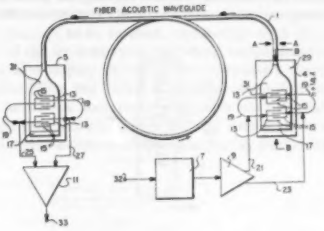
Continuation-in-part of Ser. No. 495,745, Aug. 8, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,353

Int. Cl.² H03H *9/30, 9/26, 9/32*

U.S. Cl. 333—30 R **22 Claims**

1. A fiber acoustic waveguide comprising: a single crystal fiber having a cross-sectional area substantially equal to the square of the wavelength of an acoustic signal to be coupled thereto, and an outer elongated surface, extending in the direction of acoustic wave propagation; and a single crystal

film deposited on the outer elongated surface of said crystal fiber, wherein said single crystal film has a higher velocity of



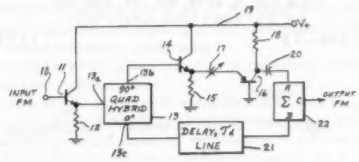
acoustic propagation than said single crystal fiber, said film being used to guide acoustic energy into said fiber.

3,975,699

LINEAR ROLL-OFF FILTER NETWORK

James B. Van Anda, Willingboro, and James S. Tyson, Beiran, both of N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 19, 1975, Ser. No. 588,553
Int. Cl.² H03H 7/10
U.S. Cl. 333—70 R **3 Claims**



1. A linear filter network with a linearly decreasing amplitude versus frequency characteristic and a concurrent linear phase response comprised of a phase splitter receiving an input FM signal and providing in response thereto two output signals of equal amplitude, the first having a 90° phase and the second zero degrees, an amplifier driver receiving said first output signal, a differentiator amplifier, a variable capacitor interconnecting said driver amplifier and said differentiator amplifier, the gain of said differentiator amplifier being set by the adjustment of said variable capacitor thereby selecting a preselected null frequency of said linear filter network, means to delay said second output signal a predetermined time exactly equal to the propagation delay of said driver amplifier and differentiator amplifier in combination so as to restore the phase relationship of said two output signals, and means to vectorally sum the delayed signal and the differentiated signal to provide a resultant signal having a linear function with respect to frequency.

3,975,700

RADIO-FREQUENCY SIGNALING CABLE FOR INDUCTIVE-CARRIER COMMUNICATIONS SYSTEMS

William S. Halstead, New York, N.Y., assignor to Carrier Communications, Inc.

Continuation of Ser. No. 160,316, July 7, 1971, abandoned, which is a division of Ser. No. 632,699, April 21, 1967, Pat. No. 3,609,247. This application Dec. 27, 1973, Ser. No. 428,691
Int. Cl.² H01Q 13/20; H01P 3/02
U.S. Cl. 333—84 L **7 Claims**

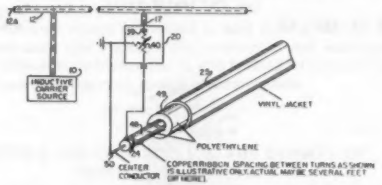
1. A solid radio-frequency inductive signaling cable structure comprising:

a center conductor;

a first solid dielectric means disposed about said center conductor;

a conducting ground sheath disposed about said first dielectric means, said center conductor and said conducting ground sheath forming a coaxial portion of said cable of such configuration that when said sheath is grounded it confines therein any signal energy in said center conductor;

a second solid dielectric means disposed about said conducting ground sheath and having low-loss characteristics at radio frequencies;



an inductive-signaling conductor disposed about said second dielectric means in convolute manner at a constant spacing from said conducting sheath, and being of such configuration that when a radio frequency signal is induced therein, a radio field external to said cable is formed around and along the length of said cable having an induction field of a high level of intensity suitable for induction signaling and having a negligible far field; and

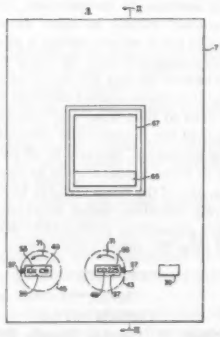
a third solid dielectric means disposed about said inductive-signaling conductor having low-loss characteristics at radio frequencies and including an outer protective jacket for said inductive-signaling cable.

3,975,701

CIRCUIT BREAKER WITH ONE-WAY ADJUSTMENT OF TRIPPING CURRENT LEVEL

Allen J. Hendry, Beaver, and Alfred E. Maier, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1974, Ser. No. 513,784
Int. Cl.² H01H 71/74
U.S. Cl. 335—176 **5 Claims**



1. A circuit breaker comprising:

a housing;

separable contacts;

trip means operable to effect automatic separation of said contacts when current flow through said contacts is equal to or above a predetermined tripping current level, said

contacts and said trip means being supported within said housing; and

adjustment means coupled to said trip means for varying said tripping current level, said adjustment means permitting adjustment to reduce said tripping current level and preventing adjustment in any manner which results in an increase in said tripping current level.

3,975,702

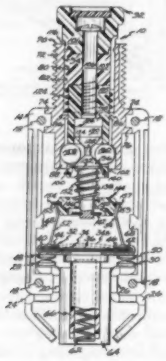
CIRCUIT BREAKER

Horace G. Carpenter, North Dighton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 14, 1975, Ser. No. 567,899

Int. Cl.² H01H 71/16

U.S. Cl. 337—62 **4 Claims**



1. A circuit breaker comprising a base, first electrical contact means mounted on the base, thermostatic contact means movable between a closed circuit position engaging the first contact means and an open circuit position spaced from the first contact means, the thermostatic contact means having a pair of arms extending therefrom in spaced side-by-side relation to each other and having a thermostatic portion for moving the distal ends of the arms relative to each other in response to an increase in temperature, means biasing the thermostatic contact means to open circuit position, and manually movable latch means having a pair of spaced latch surfaces slidably engageable with the distal ends of the respective arms for manually moving the thermostatic contact means into closed circuit position against said bias and for permitting the distal arm ends to slide from said surfaces when the thermostatic portion of the thermostatic contact means is heated to a selected temperature, thereby to allow the thermostatic contact means to move automatically to open circuit position under said bias, one of the latch surfaces having surface means thereon relatively retarding sliding movement of a distal arm end thereon for permitting preferential sliding of the other distal arm end from the other latch surface.

3,975,703

THERMOSTAT

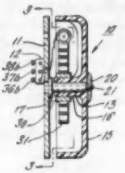
John H. Andresen, Jr., Cayman Islands, British West Indies, assignor to E-P Products, Inc., New York, N.Y.

Filed May 6, 1975, Ser. No. 575,022

Int. Cl.² H01H 37/52

U.S. Cl. 337—374 **7 Claims**

1. A thermostat comprising a base; a stud carried by said base; a cover rotatably mounted on said stud and substantially parallel to said base; a thermally responsive member carried by said cover; a mercury switch mounted within said cover, said mercury switch being angularly movable with respect to said cover; a connection between said thermally responsive member and said mercury switch; the angular position of said switch being varied by said thermally responsive member in



accordance with ambient temperature conditions; rotation of said cover with respect to said base adjusting the initial angular position of said switch; the adjusting of said initial angular position of said switch by said rotation of said cover being made with respect to gravity and requiring no stationary lubber line.

3,975,704

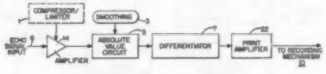
METHOD OF AND APPARATUS FOR SONAR AND RELATED SIGNAL TEXTURE ENHANCEMENT OF RECORDING MEDIA

Martin Klein, Salem, N.H., assignor to Klein Associates, Inc., Salem, N.H.

Filed Nov. 4, 1974, Ser. No. 520,788

Int. Cl.² G01S 9/66; G01D 9/00

U.S. Cl. 340—3 F **13 Claims**



1. A method of enhancing the texture of sonar and similar signals of relatively large dynamic signal range as recorded upon recording systems of relatively limited dynamic signal range, that comprises, receiving said signals; converting the received signals into corresponding absolute value signals; smoothing the same; differentiating the smoothed absolute value signals to produce derivative signals therefrom; controlling said differentiating to limit the rise and fall time of the derivative signals within a limited dynamic range of the intended recording of the signals; and recording the controlled derivative signals within said limited dynamic range in order to bring out fine textured signal detail while substantially matching the signal dynamic range to that of the recording.

3,975,705

COLOR DISPLAY OF GEOPHYSICAL AND OTHER DATA

Emmett J. Klein, Jr.; Clyde W. Hubbard, Jr., both of Houston, Tex., and Lloyd R. Chapman, Sevenoaks, Kent, England, assignors to Seiscom Delta Inc.

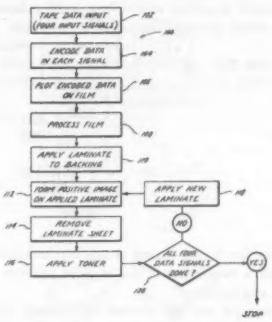
Division of Ser. No. 441,012, Feb. 11, 1974. This application Mar. 6, 1975, Ser. No. 555,847

Int. Cl.² G01V 1/34

U.S. Cl. 340—15.5 DS **4 Claims**

1. In forming color graphic displays directly from a sequence of input digital data values, wherein differing colors at data display points in the color displays are quantitatively indicative of differing values or ranges of values of the digital data, and processed input digital data to be displayed at the data display points have numerical codes assigned thereto from an assignment table, with the assignment table comprised of a set of numerical codes referenced as a two-dimensional matrix, one dimension of the matrix representing sam-

ple values of the data to be displayed, each sample value representing an assigned range from a plurality of ranges into which the input data values are partitioned, and the other dimension of the matrix representing a plurality of component displays, one component display for each component color in the color displays to be formed, and further with the numerical codes of the set specifying the visual image densities to be formed at data display points of the component displays and further specifying the relative density of each component color in the colors associated with such data display points according to the sample values thereof, and further with the numerical codes assigned to the data display points organized



into output sequences for each of the component displays, improved apparatus for forming a component color display for each output sequence, comprising:

a. means for plotting the output sequences onto corresponding film transparencies;

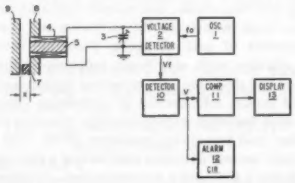
b. means for forming a positive image for each of the plotted output sequences whose image densities vary according to the numerical codes of such output sequence; and

c. means for depositing a polymer coating on a display surface according to the image densities of the positive image for each of the plotted output sequences wherein a color toner may be applied to form a component color display.

3,975,706
ABNORMALITY-DETECTING DEVICE IN A BRAKE SYSTEM

Takayuki Kato, Aichi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed May 1, 1974, Ser. No. 465,821
Claims priority, application Japan, May 4, 1973, 48-49963
Int. Cl.² B60T *17/22*
U.S. Cl. 340—52 A **19 Claims**



1. In a vehicle brake system of the type comprising a braking rotary element of magnetic flux absorbing material which is adapted for rotation together with a wheel of a vehicle, a brake shoe disposed adjacent to said braking rotary element, faced relative to said braking rotary element and having a braking frictional lining element thereon, and an abnormality-detecting device for sensing the existence of an abnormal condition in said vehicle brake system, the improvement comprising:

a resonance circuit comprising a pick-up coil wound about a core made of a thermomagnetic material secured to the brake shoe for detecting a thickness displacement of and a temperature change in said braking frictional lining element of said brake shoe as a variation of the inductance in said pick-up coil and a capacitor in parallel connection to said pick-up coil;

a high frequency oscillation circuit for generating a predetermined frequency;

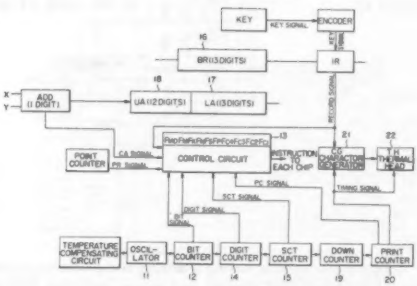
a sensing circuit coupled to said high frequency oscillation circuit and to said resonance circuit for converting variation of the inductance in said pick-up coil into electric signals; and

an indicator means connected to said sensing circuit, for indicating said thickness displacement of and warning of a critical temperature rise in said braking frictional lining element in response to said electric signals.

3,975,707
DEVICE FOR CONTROLLING THE DENSITY OF PRINTING CHARACTERS

Matsutoshi Ito, Narashino; Tatsuo Nishikawa, Tachikawa, and Kano Takeshita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,736, Sept. 26, 1973, which is a continuation-in-part of Ser. No. 132,056, April 7, 1971, abandoned. This application Feb. 10, 1975, Ser. No. 548,759
Claims priority, application Japan, Apr. 13, 1970, 45-31846
Int. Cl.² G01D *15/10*
U.S. Cl. 346—76 R **3 Claims**



1. A device for controlling the printing density of characters to be printed upon thermosensitive paper by controlling the heating of a thermal head comprising:

signal generating means for generating a pulse signal train having a certain frequency;

frequency counting down means for counting down the frequency of the pulse signal train developed from said signal generating means;

count means for counting the pulse signals from said frequency counting down means;

character signal generating means (e.g. 21 in FIG. 1, and FIG. 5) responsive to the combination of output signals from said count means and a character instruction signal for generating character signals;

a thermal head having a pluraity of thermal elements forming a character in a matrix configuration, said thermal head including driving means for driving sequentially each row line of the matrix in accordance with the output signals from said count means and simultaneously driving the selected column lines of the matrix in accordance with the output signals from said character signal generating means to heat the thermal elements provided at the intersection of the driven row and column lines; and

control means for controlling the amount of current through the selected thermal elements by varying the frequency of the pulse signal train from said signal generating means, thereby controlling the heating of the thermal elements.

3,975,708

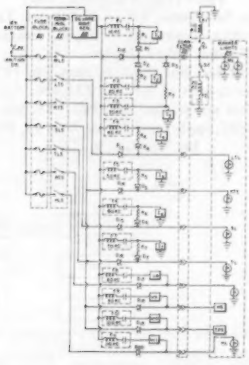
VEHICLE CONDITION MONITORING SYSTEM

Joe F. Lusk, Medford, and William H. Rood, Acton, both of Mass., assignors to T.S.W.S., Inc., Boston, Mass.

Continuation-in-part of Ser. No. 446,529, Feb. 27, 1974, abandoned. This application Dec. 11, 1974, Ser. No. 531,809

Int. Cl.[2] B60Q 1/26

U.S. Cl. 340—80 23 Claims



1. In a motor vehicle having a driving compartment, a number of electrical load devices and means including separate conductor means for providing power to each of the load devices for operation thereof, a system for monitoring the operable condition of each load device comprising;

a display console disposed in the driving compartment and including a plurality of indicator means one being associated with each load device,

oscillator means for establishing a cyclic signal having a relatively low duty cycle,

means for coupling said cyclic signal to at least one of said conductor means including a unilaterally conducting device have anode and cathode electrodes and means for sensing a change in state of the load device from an operative to inoperative state,

said conductor means also including a unilaterally conducting device having anode and cathode electrodes,

power providing means for coupling load power to said conductor means,

said unilaterally conducting devices of said means for coupling and said conductor means having like electrodes intercoupled,

and means coupled from said sensing means to said indicator means and responsive to said load device assuming its inoperative state to operate the corresponding indicator means of the display console.

3,975,709

METHOD OF AND DEVICE FOR SKELETONIZING CHARACTERS

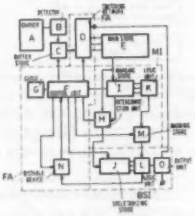
Matthijs Beun, and Pieter Reijnierse, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 196,937, Nov. 9, 1971, abandoned. This application June 12, 1973, Ser. No. 369,201

Claims priority, application Netherlands, Nov. 12, 1970, 7016536

Int. Cl.[2] G06K 9/12

U.S. Cl. 340—146.3 H 3 Claims



1. A device for skeletonizing characters imaged on a carrier, according to a two-dimensional regular pattern of positions, said device comprising:

a detector and storage means associated therewith, said detector feeding information of the characters into said storage meeans so that the characters are stored as digital information of character positions and background positions, respectively;

skeletonizing means for receiving and changing information of character positions into those of background positions until the information of character positions have been reduced to information of character positions of skeleton characters whose stroke elements consists of a single series of character positions which succeed each other in accordance with an adjacency criterion, said sketetonizing means comprising a control unit associated with said storage means for controlling skeletonizing of said characters in cycles, said control unit operative in two modes, a first mode having at least one cycle and a second mode having at least one cycle;

a first deciding unit connected to said control unit for receiving during a cycle of the first mode, at least the information of positions neighboring those character positions, said first deciding unit incorporating an edge criterion and associating additional information with the information of the character positions to compare whether said character positions satisfy said edge criterions; and

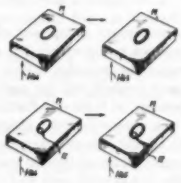
a second deciding unit connected to said first deciding unit for receiving the information of the character positions and those positions neighboring said character positions during said first mode, said second deciding unit incorporating a logic indispensability criterion and comparing the information of said character positions satisfying said edge citerion with said logic indispensability criterion, said second deciding unit receiving during a cycle of said second mode, information of remaining character positions with the logic indispensability criterion regardless of whether said remaining positions satisfy said edge criterion, said second deciding unit having a first and a second circuit for a first and a second indispensibility sub-criterion, respectively, it being possible to activate said circuits by said control unit, said control unit activating only the first circuit during cycles of the first mode, but activating both circuits during cycles of the second mode, said first circuit supplying a signal if removal of a character would cause an interruption between two character positions still present, said second circuit counting the number of character positions neighboring said character positions,

and supplying a signal if this number amounts to one, which means that the character position constitutes an end of a character which might other wise be unduly eroded by removal of said character position, the second deciding unit being capable of preventing the removal of a relevant character position under the control of at least one of said signals.

3,975,710
CHARACTER PATTERN RECOGNITION METHOD AND APPARATUS USING FEATURE ENHANCED MAGNETIC DOMAIN PATTERNS

Teruji Watanabe, Niza, and Hideo Ishihara, Kamakura, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Mar. 4, 1974, Ser. No. 448,068
Claims priority, application Japan, Mar. 5, 1973, 48-25145
Int. Cl.² G06K 9/08
U.S. Cl. 340—146.3 C **11 Claims**



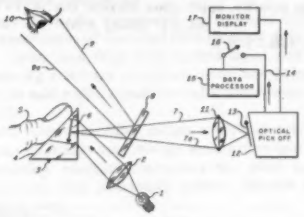
1. A method of character pattern recognition comprising:
a. providing a magnetic thin film capable of forming magnetic domains therein;
b. biasing the magnetic thin film with an external magnetic field to form a large magnetic domain within the magnetic thin film;
c. heating a region of the large magnetic domain formed in the magnetic thin film to develop a region of magnetization having a spatial polarity opposite that of the large magnetic domain and shaped like a character pattern to be recognized;
d. changing the intensity of the biasing magnetic field to effect growth of the region of magnetization shaped like the character pattern to be recognized to effect enhancement of distinguishing features of the character pattern to be recognized; and
e. then comparing the shape of the region of magnetization shaped like the character pattern to be recognized and having its distinguishing features enhanced with patterns of known characters, having the distinguishing features of the known character patterns similarly enhanced, to determine which of the known character patterns the character pattern to be recognized is most similar.

3,975,711
REAL TIME FINGERPRINT RECORDING TERMINAL

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 502,117
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 E **8 Claims**

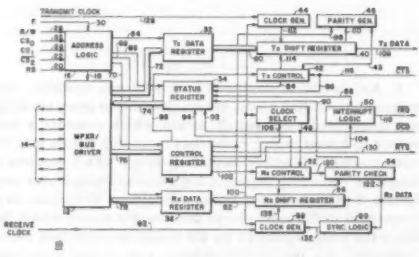
1. Apparatus for forming an image of a fingerprint pattern for comparison with a stored pattern comprising:
transparent right triangular prism means characterized by first and second opposed sides, first and second intersecting sides forming a common first edge, and a major side forming common second and third edges with said respective first and second intersecting sides,
said major side having a concave portion therewithin adapted for contact by the ridges of a finger,
light source means for forming a substantially parallel light beam having a first optical axis for incidence upon said first intersecting side whereby said light beam is refracted to illuminate said ridges at said concave portion for forming a first image of said ridges within said prism adjacent said first intersecting side, and
image forming lens means on a second optical axis for forming a second image in response to said first image.



3,975,712
ASYNCHRONOUS COMMUNICATION INTERFACE ADAPTOR

Edward C. Hepworth, Apache Junction; Rodney J. Means, Tempe, both of Ariz., and Charles I. Peddle, Norristown, Pa., assignors to Motorola, Inc., Chicago, Ill.

Filed Feb. 18, 1975, Ser. No. 550,336
Int. Cl.² G06F 3/00; H04J 3/00; H04Q 5/00
U.S. Cl. 340—147 R **21 Claims**

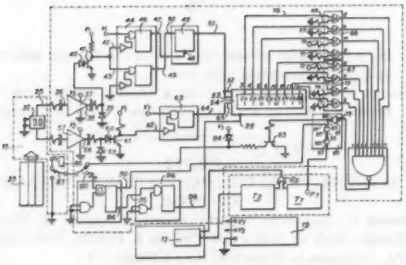


1. A digital system for controlling asynchronous data communication between a bidirectional data bus and a peripheral device comprising:
transmitter means coupled to said peripheral device for formatting and serializing parallel data and transmitting said data to said peripheral device;
receiver means coupled to said peripheral device for receiving serial data from said peripheral device, verifying a data format of said serial data and converting said serial data to a parallel format;
interface buffer means coupled between said bidirectional data bus and said transmitter means and said receiving means for controlling said receiver means and said transmitter means; and
status means coupled between said interface buffer means and said transmitter means and said receiver means for monitoring said transmitter means and said receiver means and storing information representative of status of said transmitter means and said receiver means and transferring said information through said interface buffer means to said bidirectional data bus.

3,975,713
SIGNAL GENERATING DEVICE ACTUATED BY A NON-REUSABLE TWO CHANNEL CODED MAGNETIC RECORDING MEDIUM

Victor Rivero, Gral. Pedro Antonio de los Santos No. 70-20. Piso, Mexico City 18, Mexico

Filed June 9, 1975, Ser. No. 585,170
Claims priority, application Mexico, Dec. 4, 1974, 155349
Int. Cl.² H04Q 3/00
U.S. Cl. 340—149 R 13 Claims

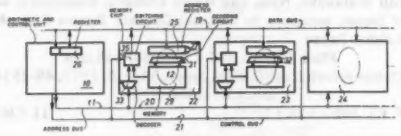


1. An electronic device actuated by non-reusable, coded magnetic recording media in two channels to generate a signal activating electronic switch means which connect a power source to a load, which comprises recording media with magnetic coding, a magnetic detecting device which receives said magnetic recording media, a logic circuit comparator means having a predetermined code, a luminous electronic device connected to the logic circuit comparator means which lights when the code registered on the magnetic recording medium coincides with the predetermined code in the logic circuit comparator means, a device for punching the magnetic recording medium, lever means for actuating the punching device, electric switch means actuated by the punching device upon punching the magnetic recording medium whereby said electronic switch means generates a signal which is combined in a logic device with the signal generated by the comparator means when the code of the magnetic recording medium coincides with the predetermined code in the logic circuit comparator means, a first programmable timer means connected between the load and the electronic switch means which permits supply to the load during a given time when the electronic switch changes to its "on" condition as a result of the said signal resulting from the logic combination and in which supply to the load is carried out during a time period determined by a constant resulting from a RC circuit means connected to said first programmable timer means, a second programmable timer means connected to said electronic switch means, a switch device between source and load which permits initial supply to load depending on the actuation of the electronic switch by the second programmable timer means for a given period, a second RC circuit means connected to second programmable timer means to control the time supply from source to load.

3,975,714
DATA PROCESSING SYSTEM INCLUDING AN LSI CHIP CONTAINING A MEMORY AND ITS OWN ADDRESS REGISTER

Gerald Weber, and Jürgen Sorgenfrei, both of Braunschweig, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Dec. 20, 1974, Ser. No. 535,092
Claims priority, application Germany, Dec. 22, 1973, 2364254
Int. Cl.² G06F 13/00
U.S. Cl. 340—172.5 12 Claims

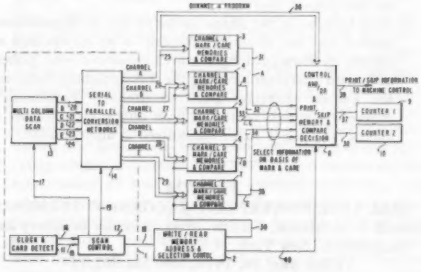


1. In a circuit arrangement composed of chips containing highly integrated circuit components for a data processing device which arrangement includes a first chip containing a central arithmetic and control unit for controlling the operation of said arrangement, at least one further chip containing a memory, and a bus connecting the chips together and including a plurality of data lines connected for selectively transferring the content of an addressed location of the memory to the arithmetic and control unit and transferring signals representing the address of a selected location of the memory to the further chip, the improvement wherein said further chip contains its own address register and means for sequentially varying the contents of its said register by counting pulses, said address register being connected to said bus to permit an entire selected address to be selectively written therein.

3,975,715
SCANNING AND SELECTION METHODS AND APPARATUS THEREFOR

Mark A. Hutner, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1973, Ser. No. 409,679
Int. Cl.² G06F 3/08
U.S. Cl. 340—172.5 11 Claims



1. Apparatus for generating output selection signals associated with each of a plurality of information data records each information data record having a plurality of data rows thereon, each of said data rows containing a plurality of data indicia, said apparatus controlling a device by comparing data indicia on said information data records with stored control data indicia from programming data records, indicia on said programming data records corresponding to indicia on said information data records, said apparatus comprising:

a. means for reading programs on said programming data records, said reading means generating from each program,

i. care/don't care control signals defining a first selected group of data indicia on said information data records,

ii. mark/no mark control signals defining a second selected group of data indicia on said information data records, and

iii. a logical mode control signal,

b. program memory storage means for storing control data bits corresponding to said care/don't care, mark/no mark control signals and said logical mode control signal,

c. means for reading said information data indicia in each of said plurality of rows, said reading means generating from each information data record information data signals associated with each row of information data indicia,

d. means for comparing said information data signals for correspondence with said stored mark/no mark control signals for providing output bit comparison signals corresponding thereto, said comparing means comprising a plurality of comparing circuits for providing one output bit comparison signal for each mark/no mark control signal,

e. gate means responsive to said stored care/don't care control signals and said logical mode control signal for controlling selections of said output bit comparison signals,

f. logic circuit means connected to said gate means to receive controlled output bit comparison signals, and

g. said logic circuit means generating said output selection signals in response to said controlled output bit comparison signals.

3,975,716

ARRANGEMENT IN CONNECTION WITH A PRINTER WITH KEYBOARD FOR PRINTING DATA IN PLAIN LANGUAGE AND SIMULTANEOUSLY RECORDING CORRESPONDING CODED DATA

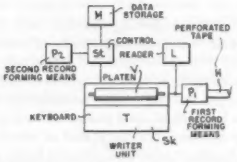
Rolf Saxholm, Aastadveien 2, Billingstad, Norway (1362)

Continuation-in-part of Ser. No. 282,941, Aug. 23, 1972, abandoned, which is a continuation-in-part of Ser. No. 53,794, July 10, 1970, abandoned. This application May 15, 1974, Ser. No. 470,316

Claims priority, application Norway, July 11, 1969, 2912/69

Int. Cl.² B41J *5/36;* **G06F** *1/00*

U.S. Cl. 340—172.5 **7 Claims**



1. In a data identification and information system having a writer unit with first input and output means and second input and output means, said first input and output means enabling the printing of plain language alpha/numeric data on at least one recording medium within said writer unit in response to signals from said writer unit or external data signals, said second input and output means generating coded output signals in response to said writer unit or external data signals,

first record forming means responsive to said coded output signals for duplicating in coded form said plain language alpha/numeric data printed by said writer unit,

reader means selectively connected to said first input and output means or said second input and output means to actuate said writer unit to print plain language alpha/numeric data in accordance with coded recorded information stored on a recording medium read by said reader means, said reader means actuating said first record forming means for duplication of coded information on the recording medium within said reader means,

second record forming means for recording coded data input signals,

the improvement comprising:

data storage means for temporarily storing said coded signals representative of specified identification data printed by said writer unit from said second input and output means during a storage operation mode and being unresponsive to said coded signals during a non-storage operation mode;

said second record forming means recording said coded signals stored in said data storage means onto said at least one recording medium containing the plain language alpha/numeric data previously printed thereon by said writer unit; and

control means for transferring said coded signals from said second input and output means to said storage means and for transferring said coded signals from said storage means to said second record forming means.

3,975,717

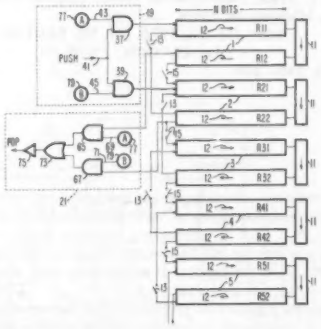
CHARGE COUPLED DEVICE STACK MEMORY ORGANIZATION AND REFRESH METHOD

Godavarish Panigrahi, Piscataway, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 9, 1974, Ser. No. 504,067

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **20 Claims**



1. A data storage device comprising:

a plurality of shift registers wherein data bits are represented by packets of stored charge, each said register having an input end and an output end, said registers being stacked one next to the other and oriented and clocked such that each register shifts in a direction opposite that of the registers adjoining it; and

means selectively operable for interconnecting said registers for enabling downshifting each of said data bits through said registers and regenerating each of said data bits or upshifting each of said data bits through said registers and regenerating each of said data bits.

3,975,718

SEMICONDUCTOR ARRANGEMENT, PARTICULARLY A STORAGE ARRANGEMENT WITH FIELD EFFECT TRANSISTORS, AND METHOD OF OPERATING THE SAME

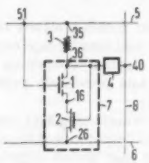
Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 25, 1974, Ser. No. 509,309

Claims priority, application Germany, Sept. 28, 1973, 2348984

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **32 Claims**



1. In a storage arrangement the combination of first and second field effect transistors, which are complementary to one another and connected to series, with the second transistor being of the depletion type, a load element connected in series with such transistors with one side of such load element connected to the drain terminal of the first transistor, and the other side of such load element connected to a line to which a supply voltage is connected, the drain terminal of the second transistor being connected to a second line, and the gate terminal of the second transistor being connected to the drain terminal of the first transistor.

3,975,719

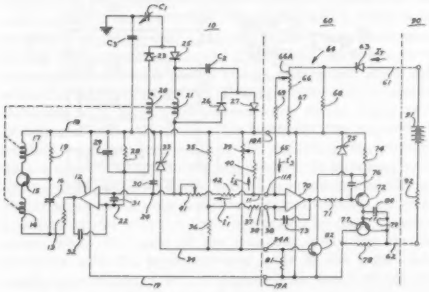
TRANSDUCER FOR CONVERTING A VARYING REACTANCE SIGNAL TO A DC CURRENT SIGNAL

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Minneapolis, Minn.

Filed Jan. 20, 1975, Ser. No. 542,124

Int. Cl.² G08C *19/10*

U.S. Cl. 340—200 **23 Claims**



1. A two wire current transmitter for providing a direct current signal proportional to a condition to be measured comprising first and second terminals for connection to a direct current supply means; a resistance network connected to said first terminal; a current controller in series with the resistance network and connected to said second terminal, said current controller comprising first means connected to the resistance network to provide a current shunt path between said resistance network and said second terminal, and amplifier means having an input and an output, said amplifier means output being coupled to said first means to control the current through said first means as a function of signals at said amplifier means input, and second means connected to said resistance network and said amplifier means to provide a signal at the input of said amplifier means which is a function of the current through said resistance network; an input stage means connected between said first and second terminals including means defining at least two separate current paths, at least one of which is a regulated current path, and including a transducer to provide an electrical signal in response to a parameter to be measured, said input stage means being coupled to said resistance network and to said input of said amplifier means of the current controller and providing an excitation current to said transducer, a Zener diode connected in the regulated current path to provide a precise reference voltage across said Zener diode, a resistance voltage divider connected directly across said Zener diode, said resistance voltage divider having a voltage signal connection connected to said input of said amplifier means; said current controller comprising means to regulate the current in said regulated current path comprising a transistor having a collector, an emitter and a base and being connected to transmit between its collector and emitter a portion of the current passing through said shunt path, and a resistor connected between the base and emitter of said transistor, the base of said transistor being connected to said regulated current path; and said input stage means including fourth means to provide an output signal to the input of said amplifier means which is a function of the parameter to be measured, said amplifier means thereby adjusting current through said first means and said second means in response to the output signal of said input stage means.

3,975,720

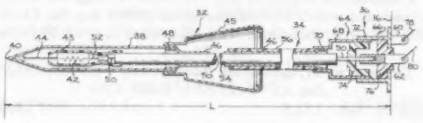
FOOD THERMOMETER FOR MICROWAVE OVEN

David Y. Chen, and Louis H. Fitzmayer, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 447,087, March 1, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 616,049

Int. Cl.² G08B *21/00*; G01K *1/08, 7/24*

U.S. Cl. 340—228 R **12 Claims**



1. Apparatus for monitoring the internal temperature of food being cooked in the cooking cavity of a microwave oven with microwaves of a predetermined frequency having a predetermined wavelength λ, said apparatus comprising:

a. a temperature-sensing probe adapted for insertion into the food to be cooked, said probe including an elongated, conductive housing, the distal end of which is closed and shaped to facilitate insertion into the food, and said probe further including a thermally-responsive electrical element positioned internally of the housing near the distal end;

b. circuitry responsive to thermally-induced changes in a characteristic of said electrical element to produce a control effect indicative of the food temperature; and

c. a flexible shielded cable connecting said electrical element to said circuitry, the cable shield being electrically connected at one end to said probe housing and at the other end to a wall of the cooking cavity, the total effective electrical length of said probe and said cable, measured along the cable and probe from said cavity wall to the distal end of said probe, being approximately equal to $n\,\lambda/2$, where n is any integer, whereby in use the combination of said shielded cable and said probe is non-resonant at said predetermined wavelength λ and said electrical element is completely shielded from microwave energy.

3,975,721

DIFFERENTIAL RELAY ARRANGEMENT FOR DETERMINING WHEN ONE OF TWO COOPERATING LAMPS, PARTICULARLY VEHICLE LAMPS, IS NOT OPERATING

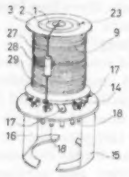
Albert Franz, Nurtingen, Germany, assignor to Hermann Stribel KG, Nurtingen, Germany

Filed July 3, 1974, Ser. No. 485,733

Claims priority, application Germany, July 10, 1973, 7325373

Int. Cl.² G08B *21/00*

U.S. Cl. 340—251 **11 Claims**



1. In combination with an indicator and at least one pair of cooperating vehicular lamps including a first lamp and a second lamp, an arrangement for activating said indicator when only one of said pair of cooperating vehicular lamps is operating, the arrangement comprising at least one cylindrical coil unit having a winding comprised of two wires including a first wire and a second wire; first means connecting said first wire to said first lamp and operative when said first lamp is operating for causing said first wire to carry a first current producing a first magnetic field; second means connecting said second wire to said second lamp and operative when said second lamp is operating for causing said second wire to carry a second current producing a second magnetic field which opposes and at least partly cancels out said first magnetic field; an encapsulated magnetic field responsive switch unit comprised of a magnetic field responsive switch encapsulated in a gas-tightly sealed capsule filled with a protective gas, the encapsulated switch unit being positioned in the center of said coil unit and oriented to become activated when only a single one of said fields is produced and to remain unactivated when both said fields are produced; and means connecting said encapsulated switch unit to said indicator and operative for activating said indicator when said encapsulated switch unit becomes activated, wherein said arrangement further includes a base plate provided with a cutout, and wherein said coil unit is provided with a foot portion provided with at least one locking portion which engages and is locked in said cutout fixedly mounting said coil unit on said base plate, and wherein said base plate is provided with a soldering lug projecting into said cutout and into the interior of said coil unit and connected to one terminal of said encapsulated switch unit.

3,975,722

PROTECTIVE ALARM SYSTEM

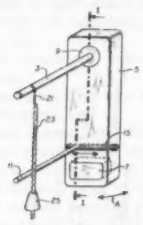
Shaul Adler, 4 Eban Gevirol St., and Dani Adler, 25 Hess St., both of Herzelia, Israel

Filed Feb. 3, 1975, Ser. No. 546,473

Int. Cl.² G08B *21/00*; **H01H** *35/02*, *35/14*

U.S. Cl. 340—261 **3 Claims**

1. A vibration sensitive electrical alarm system comprising an electrical conductive pendulum means swingably suspended from an axle member, a pendent body pivotally attached to said axle and having an electrically conductive projection secured to it extending in the direction of said pendulum means, said pendent being provided with adjustable biasing means adapted to vary its distance from said pendulum when the pendulum is at rest, wherein said biasing means is a screw adapted to turn in a thread provided in the pendent in a plane substantially normal to the longitudinal axis of the pendent and thereby to shift the weight of the pendent to overcome the force of gravity acting upon it and in turn to bias it toward one side relative the freely suspended pendulum, the



arrangement being such that when the pendulum means is set into motion, it is adapted to touch said projection whereby an alarm is activated.

3,975,723

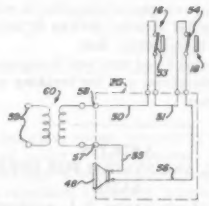
DOOR ALERT SYSTEM AND MAGNETIC SWITCH THEREFOR

Roy E. Bowling, Denver; Arnold J. Buchtel, Lakewood, and Dwight E. Keller, Denver, all of Colo., assignors to Overhead Door Alert Company, Inc., Denver, Colo.

Filed May 14, 1975, Ser. No. 577,452

Int. Cl.² G08B *21/00*, *13/08*

U.S. Cl. 340—274 R **9 Claims**



1. A system for indicating the location of a member which is movable bidirectionally over a predetermined distance relative to a fixed structure comprising:

signal emanating means connected for moving in a predetermined path in response to movement of the movable member,

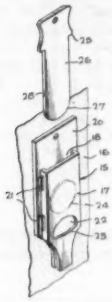
at least two spaced signal detecting means each including an electrical switch means and means responsive to signals from said emanating means whenever said signals originate in a preselected zone in proximity to the associated said detecting means, each said switch means being operable by the associated said signal responsive means for assuming a first conductive state whenever signals from said emanating means are originating from within said preselected zone and for assuming a second conductive state otherwise, said detecting means being attached to the fixed structure so that respective said preselected zones are in spaced relation along said emanating means predetermined path, and

annunciator means connected for responding to the concurrence of said second conducting state for all of said switch means for producing an output indicative that said signal emanating means is in a position along said predetermined path other than within one of said preselected zones.

3,975,724
ROOM STATUS SIGNALING SYSTEM

Bethel F. Schultz, 8553 Orion St., Sepulveda, Calif. 91343

Filed July 31, 1975, Ser. No. 600,846
Int. Cl.² G08B 25/00
U.S. Cl. 340—286 10 Claims

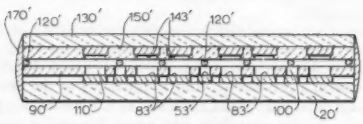


1. A room status signaling system comprising:
a display panel having a plurality of attention seeking devices;
a coin receptacle mounted in said room remote from said display panel;
an occupancy electrical circuit interconnecting said receptacle with said display panel operable to selectively energize said attention seeking devices to indicate presence of a coin therein;
a vacancy electrical circuit interconnecting said display panel with said receptacle operable to selectively energize said attention seeking devices to indicate the non-presence of a coin therein; and
means insertably received into said receptacle for dislodging the coin therefrom and for breaking said occupancy electrical circuit.

3,975,725
DISPLAY PANEL AND SYSTEM FOR OPERATING THE SAME

James A. Ogle, Neshanic Station, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 428,415, Dec. 26, 1973, Pat. No. 3,886,389. This application Nov. 29, 1974, Ser. No. 528,379
Int. Cl.² G09F 9/32
U.S. Cl. 340—324 M 2 Claims

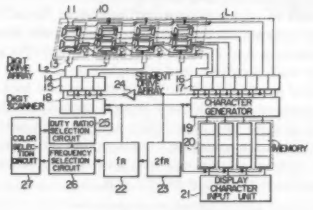


1. The method of operating a display panel which comprises
a gas-filled envelope having a viewing window and including a plurality of coplanar cathode pairs arrayed in rows and columns, each pair of cathodes including a scan cathode and a display cathode, the cathode glow generated by a display cathode being adapted to be viewed through said viewing window and the cathode glow generated by a scanning cathode being adapted to provide excited particles to expedite the generation of cathode glow by the associated display cathode,
all of the scan cathodes in a column being electrically connected and all of the display cathodes in a column being electrically connected, there thus being a plurality of columns of scan cathodes each having an associated column of display cathodes,
there thus being a first column of scan cathodes and a first associated column of display cathodes, a last column of scan cathodes and a last column of display cathodes, and intermediate columns of scan cathodes each having an associated column of display cathodes,
there also being a plurality of rows of cathode pairs, each such cathode pair including a scan cathode and a display cathode, and
a row anode overlying and in operative relation with each row of cathode pairs, there thus being one anode for each row of cathode pairs,
said method comprising
energizing all of said row anodes and said first column of scan cathodes in a circuit to produce scan cathode glow in all of the scan cathodes of said first column,
energizing selected ones of said row anodes and the first column of display cathodes in a circuit to produce display cathode glow in the display cathodes associated with said selected row anodes, and substantially simultaneously de-energizing said first column of scan cathodes,
re-energizing said first column of scan cathodes and substantially simultaneously de-energizing said selected display cathodes, and
repeating said series of steps for all of said columns of scan cathodes and display cathodes sequentially and repetitively throughout said panel at such a rate that an apparently stationary but changeable message is displayed by all of the selected display cathodes.

3,975,726
METHOD AND DEVICE FOR DRIVING IN TIME DIVISION FASHION FIELD EFFECT MODE LIQUID CRYSTAL DISPLAY DEVICE FOR NUMERIC DISPLAY

Hideaki Kawakami, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed May 20, 1974, Ser. No. 471,602
Claims priority, application Japan, May 23, 1973, 56805/73
Int. Cl.² G08B 5/36
U.S. Cl. 340—336 8 Claims

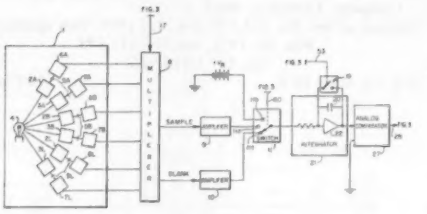


1. A method of driving in time division fashion a field effect mode liquid crystal display device for numeric display, having a plurality of sets of segment electrodes, each set being provided for one digit, and a plurality of separated digit electrodes disposed opposite to the plurality of segment electrode sets respectively, the corresponding segment electrodes of the respective digits being commonly interconnected, said method comprising the steps of maintaining the amplitude of a.c. voltages applied to the display points in the half-selected and the non-selected states when the associated digit electrodes are not selected at a constant value, while controlling the effective value of a.c. voltages applied to the display points in the selected states by changing the duty ratio of the width of the selection pulse to the time interval of the successive selection pulses.

3,975,727
AUTOMATED CALIBRATION AND STANDARDIZATION APPARATUS

Arthur H. Mader, Mount Vernon; Donatas V. Gasiunas, Carmel, and Edward W. Stark, Garden City, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed June 28, 1974, Ser. No. 484,027
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 NT **25 Claims**

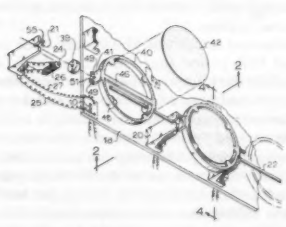


1. Apparatus for processing signals comprising means for analyzing fluid samples for the concentration of a particular constituent and for obtaining resulting analytical signals, each of said signals varying as a function of the concentration of said constituent in each sample, means for calibrating said apparatus on a two point basis, said calibrating means comprising reversible counter means for producing a time reference corresponding to the response of said apparatus to a first calibration standard of known concentration, said calibration means further including means for comparing by a successive approximation algorithm the response of said apparatus to the known concentration of a second calibration standard, said comparing means including means for presenting the known concentration of said second calibration standard to a digital comparator for iterative comparison with successive responses of said analyzing means to said second concentration standard so as to derive a control word, means including an A/D converter means comprising a dual-slope integrator for converting each of said analytical signals corresponding to said samples to a proportional time duration, means for generating the first derivative function of said varying function, and processing means for linearizing and scaling each of said analytical signals according to said derivative function, said corresponding time duration, said time reference and said control word.

3,975,728
ELECTROMAGNETIC DISPLAYS WITH RESILIENTLY MOUNTED COMPONENTS

Donald Winrow, Weston, Canada, assignor to Ferranti-Packard Limited, Toronto, Canada

Filed Mar. 28, 1975, Ser. No. 563,227
Int. Cl.² G08B *5/00*
U.S. Cl. 340—373 **9 Claims**



1. Rotatable element for display or indicator comprising:

a peripheral ring, the locus of said ring approximately corresponding to a plane;

a pair of mounting ears projecting from said ring on opposite sides thereof;

said rings being arranged and apertured to define aligned holes to receive a shaft which is arranged to rotatably support said ring with said shaft generally parallel to the plane of said ring;

a longitudinally extending support member extending across said ring;

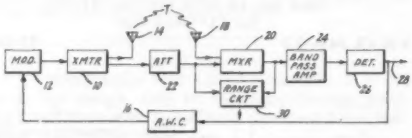
tabs extending inwardly from said ring on opposite sides of said support member; and

said tabs and said support member being so arranged that a resilient disc contrastingly colored on opposite sides and shaped to be received inside said ring may be applied thereto and resiliently bent to contact said tabs on one side and said support member on the other side is bent into an arrangement which is concave-convex when viewed longitudinally relative to said support member and means for mounting on said ring a magnet, said support member and said disc being designed so that the contrasting faces of said disc may be viewed in a given direction in the roughly opposite orientations of said frame.

3,975,729
TARGET DETECTING SYSTEM

Hayden N. Ringer, Palmyra, N.J., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed May 31, 1957, Ser. No. 662,944
Int. Cl.² G01S *9/06*
U.S. Cl. 343—5 PD **19 Claims**



1. A radar detection system comprising means for generating time spaced pulses of high frequency energy, said pulses having a width equal to a/nf_r, where a and n are integers and f_r is the pulse repetition frequency, means for projecting said energy pulses into space, receiver means for receiving target reflected echoes of said projected pulses, said receiver means including a heterodyne mixer, a bandpass circuit connected to the output of said heterodyne mixer, and means for supplying received echo signals to said mixer, means for supplying pulses corresponding to said generated pulses in pulse repetition frequency, pulse width and frequency to said heterodyne mixer as a local oscillator signal, said bandpass circuit having a passband centered at the frequency nf_r, the width of said passband being not greater than f_r.

3,975,730
RADAR DATA SELECTION EQUIPMENT

Takamasa Maeda; Yasuhiko Kamata; Shyozo Shimaya; Taiji Tatsuta; Takamasa Yamashita; Hiromi Kawakami; Takeshi Matsuki; Yoshiaki Yato, all of Tokyo; Michinori Yokouchi, and Takeshi Kijima, both of Amagasaki, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 5, 1974, Ser. No. 529,954
Claims priority, application Japan, Dec. 19, 1973, 48-141363; Dec. 19, 1973, 48-141364
Int. Cl.² G01S *9/02*
U.S. Cl. 343—6 R **7 Claims**

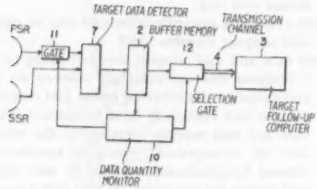
1. A radar data selection equipment comprising:

a quantizer for quantizing analog data supplied from a primary radar which receives waves reflected from a

target and from a secondary radar which receives data supplied from the target;

a target data detector for detecting the target data according to the signal quantized by the quantizer;

a gate disposed between the target data detector and a follow-up computer capable of inhibiting data supplied from the primary radar; and



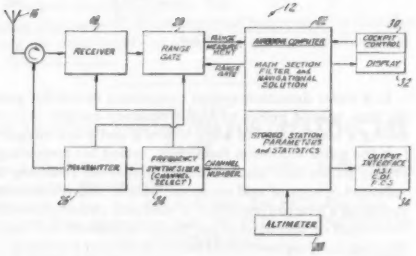
a data quantity monitor for detecting the quantity of signals supplied from the target data detector and transmitting to the gate a control command to cause the gate to inhibit the data from the primary radar when the quantity of the signals detected exceeds a predetermined set value.

3,975,731

AIRBORNE POSITIONING SYSTEM

Roy W. Latham, Orient, N.Y., and Albert N. Schultz, Jr., Charlotte, N.C., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,342
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—7.3 **17 Claims**



1. A method of accurately determining the position of an aircraft, including the steps of:

a. sequentially transmitting pulses having pre-selected frequencies corresponding to the frequencies of at least three preselected fixed DME stations;

b. switching the frequencies of the transmitted pulses to sequentially acquire each one of the fixed DME stations;

c. sequentially receiving corresponding pulses transponded by the fixed DME stations;

d. providing a predicted range measurement to the next one of the fixed DME stations in the transmission sequence based on prior measurements of aircraft position and velocity;

e. determining the actual range measurement to the next one of the fixed DME stations in the transmission sequence;

f. comparing the predicted range measurement with the actual range measurement;

g. estimating the bias error in the actual range measurement for the next one of the fixed DME stations in the transmission sequence based upon the results of the comparison of step (f); and

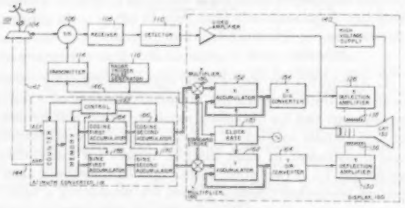
h. subtracting the estimated bias error from the actual range measurement to provide a corrected range measurement to the next one of the fixed DME stations in the transmission sequence.

3,975,732

SECOND DIFFERENCE FUNCTION GENERATOR

Gerald P. Richards, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 445,179, Feb. 25, 1974. This application Feb. 20, 1975, S... No. 551,575
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—16 R **10 Claims**



6. A radar and display system comprising in combination:

means for transmitting radar pulses;

means for receiving returned radar echoes;

radar antenna means coupled to said transmitting and receiving means;

means coupled to said radar antenna means for producing azimuth change pulses as said antenna is rotated;

means for producing a binary count in response to said pulses;

means for storing second difference values of cosine and sine functions, address inputs of said storing means being coupled to count outputs from said count producing means;

first and second sine function accumulator means, inputs of said first sine function accumulator means being coupled to data outputs of said storing means and inputs of said second sine function accumulator means being coupled to outputs of said first sine function accumulator means, said first and second sine function accumulator means each performing one accumulation operation in response to one of said azimuth change pulses, said first sine function accumulator means producing values of the first difference of sine function from said second difference values and said second sine function accumulator means producing values of said sine function from said first difference values; and

first and second cosine function accumulator means; inputs of said first cosine function accumulator means being coupled to data outputs of said storing means and inputs of said second cosine function accumulator means being coupled to outputs of said first cosine function accumulator means, said first and second cosine function accumulator means each performing one accumulation operation in response to one of said azimuth change pulses, said first cosine function accumulator means producing values of the first difference of the cosine function from said second difference values and said second cosine function accumulator means producing values of said cosine function from said first difference values.

3,975,733

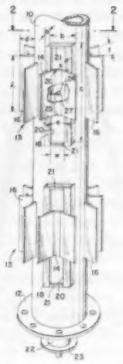
TRANSMITTING ANTENNA EMPLOYING RADIAL FINS

Richard D. Bogner, 4 Hunters Lane, Roslyn, N.Y. 11576

Filed Nov. 22, 1974, Ser. No. 526,339

Int. Cl.[2] H01Q *15/14, 19/14*

U.S. Cl. 343—770 13 Claims



1. An antenna assembly for transmitting signals of a given wavelength comprising:

a. an electrically conductive supporting structure extending along a longitudinal axis and having a major transverse dimension such as to affect the pattern of a signal transmitted by the antenna assembly;

b. a driven antenna element carried by said supporting structure;

c. a longitudinally extending forward reflecting fin of a generally rectangular outline having a longitudinal dimension between 0.12 λ and 1.0 λ and a transverse dimension between 0.2 λ and 0.9 λ positioned less than 0.5 wavelength in front of said driven antenna element on the side thereof opposite the said supporting structure for rearwardly directing at least a portion of the energy radiated by said driven element; and

d. at least one elongated electrically conductive rearward slow wave propagating device radially extending from said supporting structure and in electrical contact therewith throughout its length arranged to receive a portion of the energy directed by said longitudinally extending reflecting fin.

3,975,734

SYNTHETIC APERTURE RADARS INCLUDING MOVING TARGET INDICATION

Robert William Payne, Hillingdon, England, assignor to EMI Limited, Hayes, England

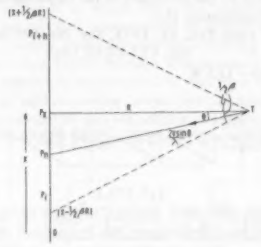
Filed Aug. 7, 1974, Ser. No. 495,495

Claims priority, application United Kingdom, Aug. 21, 1973, 39649/73

Int. Cl.[2] G01S *9/42*

U.S. Cl. 343—7.7 4 Claims

1. A synthetic aperture radar system for surveying a region from a moving location including an aerial having a plurality of space sections, a transmitter adapted to cooperate with said aerial to project a series of emitted pulses towards said region, a receiver adapted to cooperate with said aerial to receive corresponding echo pulses relating to targets in said region, the arrangement being such that a first emitted pulse is projected from, and corresponding first echo pulses are received at, at least one of said sections, a second emitted pulse is projected from, and corresponding second echo pulses are received at, at least one other of said sections at different times but at substantially the same position in relation to a predetermined frame of reference and the sequence is repeated at a first predetermined repetition frequency, processing means for comparing corresponding first and second echo pulses to substantially cancel those echo pulses relating to targets, which have not moved in relation to the frame of reference in the time elapsed between the emission of the corresponding first and second echo pulses and to provide



signals at a second predetermined repetition frequency related to the first repetition frequency, indicative of the doppler frequency shift of the pulses relating to other targets and correlator circuit means arranged to correlate those of said signals lying within a specific total frequency band with a predetermined correlation function to provide indications of the positions of said other targets, wherein the said second repetition frequency is selected to be substantially equal to the spread of said specific total frequency band.

3,975,735

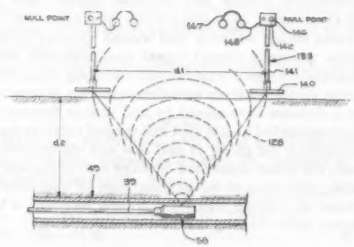
DISCHARGE PIPE LINE LOCATOR

Lester E. McCullough, 1851 W. Mountain, Glendale, Calif. 91201, and Richard E. Taylor, 8460 Cole Crest Drive, Hollywood, Calif. 95234

Filed Sept. 19, 1974, Ser. No. 507,334

Int. Cl.[2] G01S *3/02;* G01V *3/00;* G01R *19/00*

U.S. Cl. 343—112 R 16 Claims



1. An electronic locator for tracing the course of a metallic discharge line which is disposed below ground comprising:

reel means having a frame,

said reel means storing a length of flexible, hollow cable operable when rotated to drive the free end of the cable into said metallic discharge line,

An audio frequency signal generator to generate a signal of less than about 800 Hz located on said frame and in which said audio frequency signal generated by said generator has a frequency periodically varying in the range of about 400 to about 800 Hz,

a transmitter antenna attached to the free end of the cable,

conductors extending through said cable for electrically connecting said audio frequency signal generator to said transmitter antenna, and

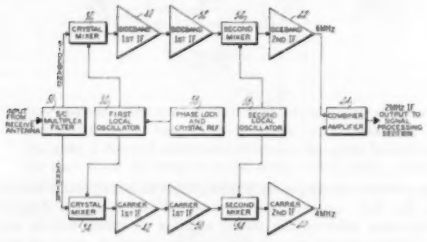
a directional receiver means for detecting the audio frequency signals generated by said audio frequency signal generator and radiated by said transmitter antenna.

3,975,736

RADIO THEODOLITE ANGLE MEASURING APPARATUS

Harold I. Ewen, Weston, and George G. Haroules, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Feb. 11, 1975, Ser. No. 549,081
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 R **12 Claims**



1. A passive direction finding intermediate frequency interferometry system comprising:

means for generating a carrier signal at a first frequency;

means for generating a modulation signal at a second frequency;

means responsive to said carrier and modulation signals for simultaneously transmitting the carrier signal and a first sideband signal displaced in frequency from said carrier by said modulation frequency;

first receiver means for receiving said transmitted carrier and sideband signals, said first receiver means including a receiving antenna and heterodyning means whereby said first receiver means provides a first output signal commensurate with said modulation signal;

second receiver means for simultaneously receiving said transmitted carrier and sideband signals, said second receiver means including a receiving antenna and heterodyning means whereby said second receiver means provides a second output signal commensurate with said modulation signal, said second receiving means antenna being displaced from said first receiving means antenna by a distance determined by said second frequency; and

means connected to said first and second receiver means for comparing the phase of said first and second output signals, the phase difference between said compared signals being indicative of the bearing angle of said transmitting means to a plane transverse to and bisecting a line between said receiving means antennas.

3,975,737

RADOME-ANTENNA STRUCTURE

Howard S. Jones, Jr., Washington, D.C., and Frank Reggia, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1975, Ser. No. 629,819
Int. Cl.² H01Q 1/42, 13/18
U.S. Cl. 343—770 **8 Claims**

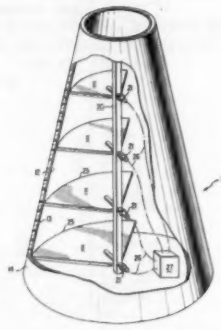
1. A radome-antenna structure comprising:

a. a radome of low-loss dielectric material having inner and outer surfaces, wherein said inner surface defines a chamber;

b. a layer of electrically conductive material on said inner surface of said radome for forming a radiation shield thereover to exclude radiation from said chamber;

c. at least one aperture through said electrically conductive material;

d. at least one radiating element aligned with said aperture to direct radiation through said aperture, said element extending into said chamber, wherein said radiating element includes a dielectric substrate registered with said aperture and an electrically conductive shield enclosing said dielectric substrate, said shield abutting and conforming to said electrically conductive layer on the inner surface of said radome to contain said radiation therebetween.

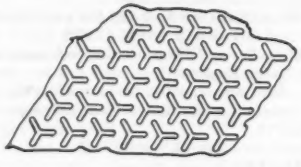


3,975,738

PERIODIC ANTENNA SURFACE OF TRIPOLE SLOT ELEMENTS

Edward L. Pelton, and Benedikt A. Munk, both of Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,503
Int. Cl.² H01Q 1/42
U.S. Cl. 343—872 **3 Claims**



1. An antenna system comprising:

a. a metallic radome; and

b. a periodic array of slot elements mounted equidistant from each other upon the radome with each of the slot elements having three arms joined at the center with an angular separation of 120° and with each of the arms of the slot elements being in parallel alignment with the one of the arms of the other slots.

3,975,739

MIGRATION IMAGING SYSTEM USING SHAPED ELECTRODE

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 54,526, July 13, 1970, which is a continuation-in-part of Ser. Nos. 327, Jan. 2, 1970, abandoned, Ser. No. 854,596, Sept. 2, 1969, Ser. No. 837,780, June 30, 1969, and Ser. No. 460,377, June 1, 1965, Pat. No. 3,520,681, said Ser. No. 327, is a continuation-in-part of said Ser. No. 854,596, and a continuation-in-part of said Ser. No. 837,780, which is a continuation-in-part of Ser. Nos. 725,676, May 1, 1968, abandoned, Ser. No. 483,675, Aug. 30, 1965, and Ser. No. 460,377, said Ser. No. 725,676, is a continuation-in-part of said Ser. Nos. 483,675, Ser. No. 460,377, and Ser. No. 403,002, Oct. 12, 1964, abandoned, said Ser. Nos. 483,675, and Ser. No. 460,377, each is a continuation-in-part of said Ser. No. 403,002.

This application Apr. 3, 1975, Ser. No. 565,014

The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl.² G03G *13/00, 13/04, 13/22*

U.S. Cl. 346—74 ES 56 Claims

1. An imaging process comprising:

providing an imaging member comprising a substrate, a substantially electrically insulating softenable layer, a fracturable layer of migration marking material contiguous the surface of and contacting the softenable layer spaced apart from the substrate, said softenable layer capable of having its resistance to migration of migration marking material decreased sufficiently to allow migration of migration marking material in depth in said softenable material, and

an imagewise-shaped electrically conductive member to the surface of said softenable layer spaced apart from the substrate; and then

electrically latently imaging said imaging member by electrically connecting said imagewise-shaped electrically conductive member to a first electrical potential and contacting the substrate to ground or to an electrical potential different from the first electrical potential, and

developing said imaging member by decreasing the resistance to migration of migration marking material in depth in said softenable layer at least sufficient to allow imagewise migration of migration marking material at least in depth in said softenable layer.

3,975,740

LIQUID JET RECORDER

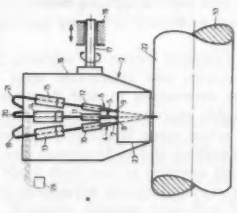
Walter Distler; Helmut Kraus; Christian Schwarz, all of Erlangen, and Oskar Schmidt, Karlsruhe, all of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 30, 1974, Ser. No. 511,032

Claims priority, application Germany, Oct. 2, 1973, 2349453

Int. Cl.² G01D *15/18;* B41J *3/04*

U.S. Cl. 346—75 6 Claims



1. In a liquid jet recorder having a jet ejecting arrangement; a pressure means conduit connected to said jet ejecting arrangement for causing the latter to propel an electrically-conductive recording liquid against a spot on a recording carrier; a control electrode located intermediate said jet ejecting arrangement and said recording carrier; a signal source for electrically charging the drops of said recording liquid between the latter and said control electrode so as to cause said drops to mutually repel each other and to disintegrate into a vapor cloud which is precipitated on the control electrode; and means for producing relative movement between said jet ejecting arrangement and said recording carrier so as to form an image constituted of image lines, the improvement comprising: said jet ejecting arrangement including a plurality of jet nozzles, a supply pump commonly supplying said jet nozzles with recording liquid through said pressure means conduit, said jet nozzles being oriented so that their ejected liquid jets impinge on said recording carrier directly adjacent to each other, said liquid jets of said jet nozzles penetrating said single control electrode and being commonly controlled thereby.

3,975,741

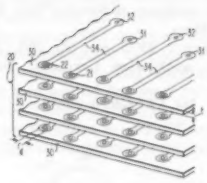
CHARGE ELECTRODE FOR INK JET

Erik R. Solyst, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 23, 1975, Ser. No. 598,482

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 17 Claims



1. A charge electrode structure for electrostatic ink jet comprising as a stacked laminate assembly:

a plurality of dielectric sheets, each having a coaxial opening therein for passage therethrough of an ink jet stream;

a plurality of planar charge electrodes, interposed between certain of said dielectric sheets and disposed around said opening; and

means electrically interconnecting said charge electrodes.

3,975,742

THERMAL PRINTING-ANTI-STICK MECHANISM

Thomas P. Kelley, Cornwells Heights, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 25, 1975, Ser. No. 616,607

Int. Cl.² G01D *15/10;* H05B *1/02*

U.S. Cl. 346—76 R 6 Claims

1. A thermal recording instrument comprising in combination:

a motor for incrementally advancing a thermally responsive web through a predetermined distance in response to a paper advance signal;

means for generating said paper advance signal;

a printhead including a plurality of selectively energizable print elements whose temperature rises above ambient temperature when energized;

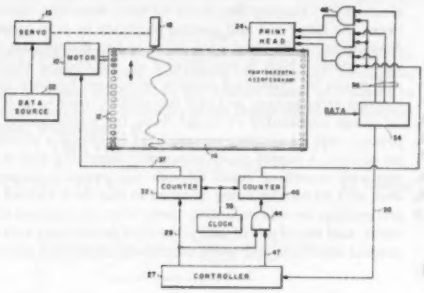
means for mounting said printhead so that said printhead is in continuous contact with said web during operation of said instrument;

means for generating a data signal;

means for generating an anticipatory signal a predetermined interval prior to the paper advance signal; and

means responsive to said anticipatory signal and said data

signal to selectively energize said elements for a predetermined interval which is sufficient in duration that said



web commences advancing before said elements return to ambient temperature.

3,975,743

TIME REGISTRATION DEVICE FOR THE RECORDATION OF PRESENCE OR WORK TIME

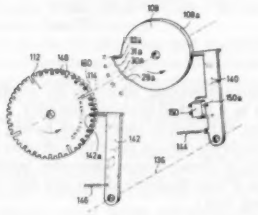
Gunther Trischler, Plochingen, and Hartmut Reichert, Zell, both of Germany, assignors to Simplex Time Recorder Company, Gardner, Mass.

Filed July 7, 1975, Ser. No. 593,721

Claims priority, application Germany, July 16, 1974, 2434074

Int. Cl.² G01D *15/20*

U.S. Cl. 346—91 **10 Claims**



1. In a time registration device for the recordation of presence or work time by means of a time controlled printing device onto a line of a registration card corresponding to a particular day, such time-registration device having

a card receptor, forming a backstop for the registration card inserted into the device in a direction perpendicular to its lines, being movable in said direction, and being advanceable daily by a drive mechanism, by at least one line;

a day-program wheel, advanceable daily by the drive mechanism, and containing at least 31 sectors, one for each day of a month, of which the 29th to 31st sectors have cams of differing heights;

a month-program wheel, being advanceable monthly and containing at least 12 sectors, one for each month, each sector forming a cam which height corresponds to the number of days within the month represented by the cam; and

scanners for the day- and month-program wheels, such scanners, together with a switch actuated therewith, forming a comparator for the additional activation of the drive mechanism in the case when the just scanned day-program wheel cam exceeds a boundary value set by the simultaneously scanned month-program wheel cam;

the improvement comprising the month-program wheel being driven together with the day-program wheel by means of friction, and

providing a locking mechanism for the month-program wheel, such mechanism being controllable by the most extreme cam of the day-program wheel.

3,975,744

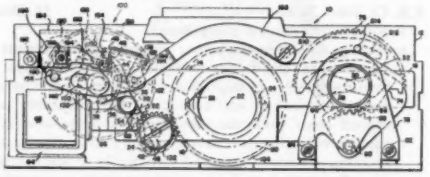
AUTOMATIC EXPOSURE CONTROL SYSTEM

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 494,994, Aug. 5, 1974, Pat. No. 3,896,458, which is a continuation of Ser. No. 376,513, July 5, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,108

Int. Cl.² G03B *7/14*

U.S. Cl. 354—29 **13 Claims**



5. A photographic control system for a camera, said camera having means for mounting photographic film material at a given focal plane so as to receive image-carrying rays transmitted along a given optical path from the scene to be photographed, and selectively operative means for selecting ambient or flash mode operation and operative in the flash mode for providing flash illumination and for determining the anticipated level of flash brightness of the scene expected from said flash illumination, said system comprising:

means actuatable for unblocking and blocking said optical path and for defining progressively changing aperture values in operative relation to said optical path during said unblocking actuation;

means operable only during said flash mode operation for cooperating with said unblocking and blocking means to establish operable aperture values in correspondence with anticipated levels of flash scene brightness determined by said determining means;

energizeable means operable during both said ambient and said flash mode operations for defining exposure time intervals in correspondence with varying levels of actual scene brightness experienced during exposure operations;

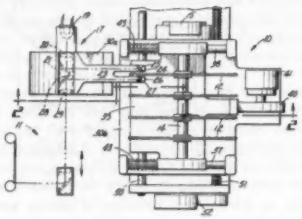
means when coupled to a source of power for actuating said unblocking and blocking means during both ambient and flash mode operation to unblock said optical path thereby initiating an exposure interval during which scene light is transmitted to said film plane and, in response to said exposure time interval defining means, to again block said optical path to thereby terminate said exposure interval; and

selectively operative means for adjusting said correspondence between said anticipated level of flash scene brightness determined by said determining means and said operable aperture values, and between said varying levels of actual scene brightness experienced during exposure operations and said exposure time intervals so that said system operates in said flash mode under the trim influence provided by said adjustment of the correspondence of both said operable aperture values and said exposure time intervals while said system operates in said ambient mode under the trim influence provided solely by said adjustment of the correspondence of said exposure time intervals.

3,975,745
FONT AVAILABILITY SYSTEM FOR PHOTOCOMPOSING MACHINE

George G. Pick, Mendham, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 17, 1975, Ser. No. 558,720
Int. Cl.² B41B 17/06
U.S. Cl. 354—7 7 Claims



1. A font storage and optical retrieval system for a photocomposition machine, comprising:

a plurality of indicia storage disc members mounted in superposed relationship, and means for rotating said disc members about a common axis, each said disc having at least one data set in a circular track path;

a projection system;

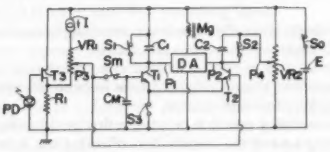
and, means for moving said discs and projection system relative to one another in a series of defined paths which select a data set track path and project the data thereon, said series of paths comprising longitudinal and lateral relative movements which first disengage the discs and system and thereafter shift the discs and system relative to one another and finally reengage a disc and the projection system to project another selected data set;

whereby, said plurality of discs may be removed from interface with said system, shifted to align a substitute disc, and repositioned to select various data sets at will.

3,975,746
AUTOMATIC EXPOSURE CONTROL CIRCUIT FOR A SINGLE LENS REFLEX CAMERA OF TTL LIGHT MEASURING TYPE

Norio Beppu, Sennan, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1975, Ser. No. 550,908
Claims priority, application Japan, Feb. 25, 1974, 49-22640
Int. Cl.² G03B 7/08
U.S. Cl. 354—51 9 Claims



1. An automatic exposure control circuit for a single lens reflex camera of the TTL light measuring type having an objective lens through which light from an object to be photographed enters the interior of the camera and an eyepiece through which light also enters the interior of the camera, which automatic exposure control circuit comprises:

a differential switching circuit which has a first input terminal and a second input terminal and for controlling the operation of a camera shutter in response to the output thereof;

a light receiving means for measuring the light entering the camera through the objective lens and he light entering through the eyepiece;

a first portion coupled to said light receiving means for receiving from said light receiving means the measured values of both the light entering through the objective lens and light entering through the eyepiece, said first portion having only a single first transistor the base of which is coupled to said light receiving means, the collector of which is connected to said first input terminal of said differential switching circuit and in which collector current proportional to said light entering through the objective lens and eyepiece flows, and further having a first capacitor connected to said first input terminal of said differential switching circuit and the collector of said first transistor for integrating said collector current, and first switch means connected in parallel with said first capacitor for short circuiting said first capacitor;

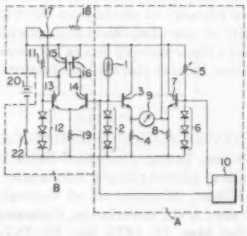
a second portion coupled to said light receiving means for receiving from said light receiving means the measured value of the light entering through the eyepiece, said second portion having only a single second transistor of the same type as said first transistor the base of which is coupled to said light receiving means and the collector of which is connected to said second input terminal of said differential switching circuit and in which collector current proportional to said light entering only through the eyepiece flows, and further having a second capacitor connected to said second terminal of said differential switching circuit and the collector of said second transistor for integrating said collector current, and second switch means connected in parallel with said second capacitor for short circuiting said second capacitor, the emitter of said second transistor being coupled to the emitter of said first transistor; and

a current source coupled to said differential switching circuit, said light receiving means and said first and second portions.

3,975,747
OFF-PHOTOMETRIC-RANGE INDICATOR FOR EXPOSURE METER

Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 1, 1975, Ser. No. 573,396
Claims priority, application Japan, May 9, 1974, 49-51645[U]
Int. Cl.² G03B 7/00; G01J 1/44
U.S. Cl. 354—60 E 7 Claims



1. In a device for indicating off-photometric-range of a photometric circuit in an exposure indicator, the indicating device including:

a photometric circuit (1, 2) adapted to generate a first voltage in correspondence to the object brightness of an object to be photographed;

an exposure factor introduction circuit (5, 6) adapted to generate a second voltage which varies according to exposure factors; and

an indicator (9) connected at one input terminal to said photometric circuit and at its other input terminal to said exposure factor introduction circuit and adapted to indicate a proper value of exposure corresponding to the difference between said first and second voltages,

the improvements comprising:

a. a detection circuit (11, 12, 13, 13, 15, 16, 19) connected to said photometric circuit and adapted to detect the object brightness and issue an output signal when the detected value of the object brightness is off the photometric range of said indicator;

b. a switching circuit (17, 25) connected to said detection circuit and arranged to operate when receiving said output signal; and

c. a circuit (18, 26, 27) connected between said switching circuit and said indicator and actuated by operation of said switching circuit to scale out said indicator thereby to give the off-photometric-range indication.

3,975,748

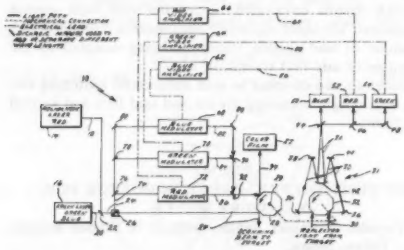
MULTISPECTRAL LASER CAMERA DEVICE

Dale Green; Duane Erway, both of Sierra Madre, Calif.; Robert Condon, Olney, Md.; William C. Schoonover, Xenia, and Norman L. Rowe, Springfield, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 22, 1970, Ser. No. 48,613

Int. Cl.[2] H04N *5/86;* G01T *1/16*

U.S. Cl. 358—78 10 Claims



1. A multispectral laser camera comprising a plurality of lasers, a first mirror scanner optically connected to said lasers, an optical receiving means operably connected to said first mirror scanner, a plurality of photomultiplier tubes operably connected to said optical receiving means, a plurality of video amplifiers electrically connected to said plurality of photomultiplier tubes, a plurality of modulators electrically connected to said plurality of video amplifiers and optically connected to said lasers, and a film receiving means for receiving the optical signals generated by said plurality modulators.

3,975,749

CONTINUOUS MICROFILMING CAMERA

Wilfried Hofmann, Taufkirchen; Karl-Heinz Dietrich; Walter Rauffer, both of Munich; Eugen Schuhmeir, Neubiberg, and Reinhard Köhler, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

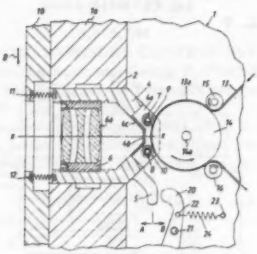
Filed Mar. 27, 1975, Ser. No. 562,428

Claims priority, application Germany, Mar. 28, 1974, 7410967[U]

Int. Cl.[2] G03B *3/00*

U.S. Cl. 354—195 10 Claims

1. In a photographic apparatus, particularly in a continuous microfilming camera, a combination comprising means for transporting photographic film along a predetermined path, said transporting means including a driven roller rotatable about a fixed axis and the film being trained over said roller with the emulsion-coated side of the film facing outwardly; a tubular support reciprocable substantially radially of said driven roller; a lens installed in said support and arranged to image originals onto the emulsion-coated side of that portion of the film which is trained over said driven roller; positioning



means including at least one roll rotatably mounted in said support intermediate said driven roller and said lens; and means for yieldably biasing said support toward said driven roller so that said roll bears against the emulsion-coated side of the film.

3,975,750

VIEW FINDER FOR A SINGLE LENS REFLEX CAMERA

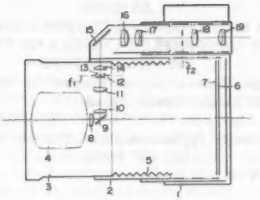
Zenzaburo Yoshino, Tokyo; Yoshikazu Ando, Musashino, and Junichi Yokozato, Kawagoe, all of Japan, assignors to Zenza Bronica Industries, Inc., Tokyo, Japan

Filed Aug. 16, 1974, Ser. No. 498,122

Claims priority, application Japan, Aug. 16, 1973, 48-92004; Feb. 21, 1974, 49-20687; Mar. 5, 1974, 49-25457; Mar. 5, 1974, 49-25851

Int. Cl.[2] G03B *13/16, 19/12*

U.S. Cl. 354—225 20 Claims



14. A single lens reflex camera, comprising in combination:

a view finder mounted in said camera;

a lens shutter mounted in said camera, shutter charging means and shutter release means respectively operatively connected to said shutter,

a first focusing means located in a first position behind the taking lens of the camera for reflecting the light coming through the taking lens at an angle with respect to the optical axis and focusing an inverted real image of an object to be photographed on a first focal plane in reduced scale, said first focusing means being movable from said first position to a second position where the first focusing means is unable to reflect the light coming through the taking lens,

a second focusing means located behind the first focal plane on the optical axis of the light reflected by said first focusing means for focusing an erected real image of said inverted real image on a second focal plane,

an eyepiece means located behind the second focal plane,

a first light intercepting means provided in the optical path of the light passing through the eyepiece,

a second light intercepting means provided in front of a film loaded in the camera to cover the same,

a first operating means associated with said first light intercepting means for moving the same into the light intercepting position when the shutter release means is operated and out of said position when the shutter charging means is operated,

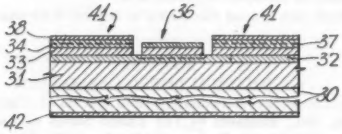
a second operating means associated with said second light intercepting means for moving the same into the position in front of the film when the shutter charging means is operated and out of said position when the shutter release means is operated, and

a third operating means associated with said first focusing means and said first and second operating means for moving the first focusing means between said first and second positions in response to the operation of the first and second operating means so that the first focusing means is moved to said first position when the shutter charging means is operated and moved to said second position when the shutter release means is operated.

3,975,751
MONOLITHIC LIGHT-EMITTING DIODE AND MODULATOR

Anthony John Springthorpe, Richmond, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 19, 1974, Ser. No. 507,454
Int. Cl.² H01L *31/12, 31/16*
U.S. Cl. 357—19 **8 Claims**



1. A monolithic light emitting diode and modulator structure, comprising:

a substrate of semiconductor material of one conductivity type, and sequential layers of semiconductor material on one major surface of said substrate, said layers comprising a first confining layer on said surface of said substrate, an active layer on said first confining layer and a second confining layer on said active layer, said first confining layer of the same conductivity type as said substrate, the second confining layer of opposite conductivity type as said first confining layer, and said active layer of the same conductivity as said first confining layer;

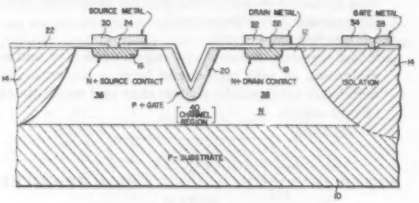
a first contact layer on another major surface of said substrate opposed to said one surface and a second contact layer on said second confining layer, said second contact layer composed of separate spaced apart portions electrically isolated to form one portion defining a light emitting section and a further portion defining a light modulating section, said first contact layer common to said light emitting and light modulating sections, said first contact layer and said portion of said second contact layer for the light emitting section providing means for applying a forward bias to said light emitting section, and said first contact layer and said portion of said second contact layer for the modulator section providing means for applying a reverse bias to said modulator section;

said active layer extending continuously across said light emitting and light modulating sections, and including a region doped to produce a p-n junction for said light emitting region removed from the interface between said active layer and said second confining layer, a p-n junction extending between said active layer and said second confining layer for the remainder of said structure, for allowing light emission from said light emitting section at a wavelength larger than the band edge of said modulator section.

3,975,752
JUNCTION FIELD EFFECT TRANSISTOR

Hugh Crawford Nicolay, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 347,681, April 4, 1973, Pat. No. 3,930,300. This application Nov. 13, 1975, Ser. No. 631,759
Int. Cl.² H01L *29/80*
U.S. Cl. 357—22 **6 Claims**



1. A junction field effect transistor comprising:

a. a substrate of semiconductor material of one conductivity type having a planar surface and constituting a first gate;

b. a first and second planar regions adjacent said surface of opposite conductivity type to said one conductivity type and constituting a source region and a drain region;

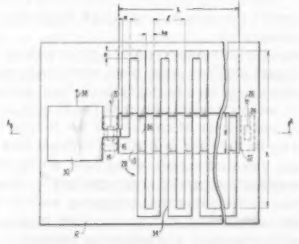
c. a third region of opposite conductivity type to said one conductivity connecting said first and second regions below said surface and constituting a channel region; and

d. a wedged-shaped fourth region of said one conductivity type separating said first and second regions above said third region, and constituting a second gate.

3,975,753
CHARGE COUPLED DEVICE INCLUDING A SLOW-WAVE STRUCTURE FOR PROVIDING CHARGE TRANSFER

Ramasesha Bharat, 2905 Echo Hill Way, Orange, Calif. 92667

Filed Nov. 8, 1974, Ser. No. 522,162
Int. Cl.² H01L *29/78;* **H03K** *3/353*
U.S. Cl. 357—24 **9 Claims**



1. In a charge coupled device having means for injecting charge signals and means for collecting said charge signals comprising:

a semiconductor substrate of one conductivity type;

a layer of dielectric material overlying the surface of said substrate and having a region of predetermined thickness, length and width, under which charge signals are adapted to move from said injecting means to said collecting means;

a slow-wave means, including a meander line electrical transmission line formed from a layer of metallization having a continuous serpentine configuration describing a plurality of interconnected line segments crossing the lengthwise dimension of said region at regularly spaced intervals in a parallel fashion and wherein said parallel line segments have a constant width dimension and equal separation therebetween and wherein said width dimension of said line segments is equal to said separation, configured to propagate an electromagnetic wave therealong, for producing an electric drift field under said dielectric layer in said region for controlling the movement of said charge signals from said injecting means to said collecting means; and

means coupling a periodic signal of regularly varying amplitude to said slow-wave structure for launching said electromagnetic wave therealong;

the improvement wherein:

said line segments traverse said region normal to said length dimension of said region and have a respective length dimension substantially greater than said width dimension of said region.

3,975,754

POWER THYRISTOR HAVING A HIGH TRIGGERING SPEED

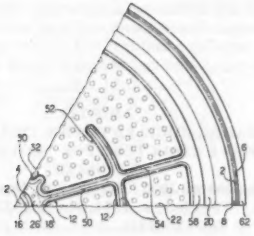
Serge Lehmann, Ste. Genevieve des Bois, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Paris Cedex, France

Filed Dec. 12, 1974, Ser. No. 532,101

Claims priority, application France, Dec. 12, 1973, 73.44330

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **7 Claims**



1. In a power thyristor having a high triggering speed, said thyristor comprising:

a semi-conductor monocrystalline plate with an anode face and a cathode face, said plate comprising successively, from the anode face to the cathode face, an anode of the P type, an intermediate layer of the N type, a base of the P type and a layer of emitters of the N type having gaps taken up by the base, so that the cathode face comprises, at least, a central region of the base, a triggering emitter surrounding that central region, an intermediate region of the base surrounding that triggering emitter and a main emitter surrounding that intermediate region and having a greater area than said triggering emitter;

a trigger formed by a metallic layer deposited on said central region of the base at a distance from said triggering emitter;

an auxiliary metal spray deposited on said triggering emitter spaced at a distance from said central region of the base and overlapping onto said intermediate region of the base;

a cathode formed by a metallic layer deposited on said main emitter at a distance from said intermediate region of the base;

two main terminals, one connected to said anode and the other connected to said cathode;

a control terminal connected to said trigger; the improvement comprising:

the outside edge of said intermediate region of the base having a corrugated shape, with valleys extending radially towards said central region and peaks extending radially away from that central region, and wherein the height of said peaks in relation to said valleys, measured radially from said central region, is between 20 percent and 5 percent of the width of said main emitter, measured in the same direction.

3,975,755

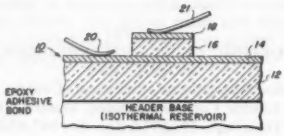
STABLE NON-CRYSTALLINE MATERIAL FOR SWITCHING DEVICES

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 17, 1975, Ser. No. 558,993

Int. Cl.² H01L *45/00*

U.S. Cl. 357—2 **2 Claims**



1. A non-rectifying solid state switching device comprising:

a body of amorphous $CdAs_2$, and

at least two spaced electrodes in contact with said body.

3,975,756

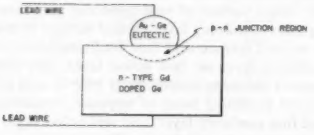
GADOLINIUM DOPED GERMANIUM

Daniel J. Lanigan, Herndon, Va., and Marvin M. Cohen, Rockville, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,038

Int. Cl.² H01L *29/167*

U.S. Cl. 357—63 **6 Claims**



3. An improved light-sensitive semi-conductor comprising an alloyed gold-germanium eutectic on the surface of a single crystal of germanium doped with gadolinium thereby forming a p-n junction.

3,975,757

MOLDED ELECTRICAL DEVICE

Christian R. Sporck, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

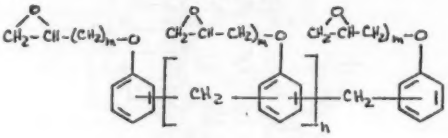
Continuation-in-part of Ser. No. 475,441, May 31, 1974, abandoned, which is a division of Ser. No. 353,458, April 23, 1973, Pat. No. 3,838,094. This application Dec. 4, 1975, Ser. No. 637,678

Int. Cl.² H01L *23/28*

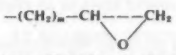
U.S. Cl. 357—72 **3 Claims**

1. A molded electrical device comprising an electrical circuit element encapsulated in a body of cured insulating mate-

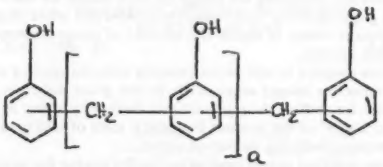
rial and having at least one conductor for connection to an external circuit, said cured insulating material being the cured product of a molding composition comprising an epoxidized novolac prepolymer I, a novolac II, a catalyst selected and in a quantity effective to catalyze the polymerization of I and cross linking with II, said catalyst being also selected so as not to confer electrically conductive properties on the cured material, and an amount not less than about 50% by weight of the composition of a surface-treated fused silica, said prepolymer I having the formula



wherein *m* and *n* are small whole numbers greater than zero and wherein all or substantially all of the phenolic hydrogens are substituted by a group



and said prepolymer II having the formula



wherein a is a small whole number greater than zero, said prepolymers being present in a ratio between about stoichiometric and about 40% molar excess of I, said fused silica filler being a finely ground fused silica the surface of which is modified by surface treatment with a silazane to render the silica particles substantially free from adsorbed moisture and free silanol groups and such that the silica is not wetted by water.

3,975,758

GATE ASSIST TURN-OFF, AMPLIFYING GATE THYRISTOR AND A PACKAGE ASSEMBLY THEREFOR

Earl S. Schlegel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 27, 1975, Ser. No. 581,256

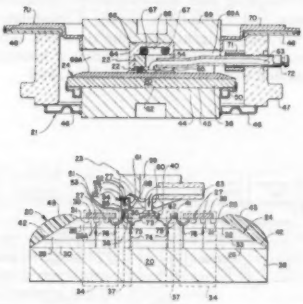
Int. Cl.² H01L *23/02, 23/12, 29/74, 23/32*

U.S. Cl. 357—74 **2 Claims**

1. An amplifying gate thyristor with gate assist turn-off capability comprising:

A. an amplifying gate thyristor disposed in a first semiconductor body having first and second major surfaces, said thyristor comprising (1) first, second, third and fourth impurity regions of alternate conductivity-type disposed through the body from said first major surface to said second major surface to form PN junctions between adjacent regions and main cathode-emitter, cathode-base, anode-base and anode-emitter regions, respectively; (2) fifth impurity region disposed in said semiconductor body adjoining said first major surface spaced adjacent said first impurity region to form a PN junction with said second impurity region and a pilot cathode-emitter region; (3) cathode and anode electrodes affixed to said first and second major surfaces, respectively, to make ohmic contact with the main cathode-emitter region and the anode-emitter region, respectively; (4) gate electrode affixed on said first major surface to make ohmic contact with the cathode-base region adjacent to and spaced from the pilot cathode-emitter region opposite from the main cathode-emitter region; and (5) floating electrode affixed on said first major surface spaced adjacent the gate and cathode electrodes to make ohmic contact with the pilot cathode-emitter region and the cathode-base region between the main and pilot cathode-emitter regions;

B. an encapsulation means adapted for packaging said amplifying gate thyristor therein, said encapsulation means



including a locator means for aligning and supporting a gate contact to make ohmic contact with said gate electrode of said thyristor, and adapted to support and align a diode relative to said gate electrode to make ohmic contact to said gate contact of the locator means and said floating electrode of said thyristor; and

C. a diode disposed in a second semiconductor body and having cathode and anode impurity regions forming a PN junction therebetween and adjoining opposed major surfaces of said second semiconductor body, respectively, said diode affixed to said locator means in said encapsulation means in alignment with said gate contact, said cathode region thereof making ohmic contact with said gate contact of said encapsulation means, and said anode region thereof making ohmic contact with an anode electrode affixed on a major surface of said second semiconductor body and adapted to make ohmic contact with the floating electrode of said thyristor.

3,975,759

COLOR KILLER CIRCUIT SYSTEM VIDEO TAPE RECORDER

Hiroshi Taniguchi, Hirakata, and Ichiro Arimura, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 11, 1974, Ser. No. 514,182

Int. Cl.² H04N *5/79*

U.S. Cl. 358—4 **5 Claims**

1. In a video signal recording and reproducing system having

a. a recording channel including

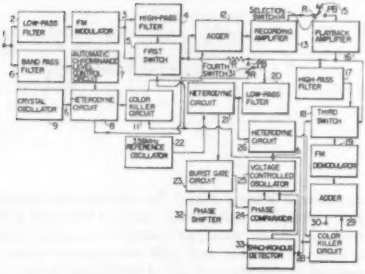
1. means for receiving a luminance signal forming part of a color television signal,

2. means for angular-modulating said luminance signal,

3. means for receiving a modulated chrominance signal including a color burst signal,
4. means for frequency-converting said modulated chrominance signal to a low-frequency modulated chrominance signal,
5. means for combining said angular-modulated luminance signal with said low-frequency modulated chrominance signal, and
6. means for recording said combined signal on a record medium, and

b. a reproducing channel including

1. a variable frequency oscillator for generating a continuous signal,
2. means for heterodyning said low-frequency modulated chrominance signal with the continuous signal from said variable frequency oscillator,
3. means for controlling the frequency of said variable frequency oscillator in accordance with the phase variations due to time-axis variations of said color burst signal thereby obtaining at the output of said means for heterodyning said low-frequency modulated chrominance and continuous signals a modulated chrominance output signal free from time-axis variations,
4. means for angular-demodulating a luminance signal obtained from said record medium, and



5. means for combining said modulated chrominance output signal free from time-axis variations with said angular-demodulated luminance signal to reproduce said color television signal,

a circuit for automatically switching between monochrome and color television signal recording and reproducing modes, comprising:

a first color killer circuit coupled in said recording channel to said means for frequency-converting said modulated chrominance signal to a low-frequency modulated chrominance signal,

a second color killer circuit in said reproducing channel,

means for coupling to said reproducing channel a part of said low-frequency modulated chrominance signal that does not pass through said first color killer circuit for control of said variable frequency oscillator,

means for phase-shifting either said color burst signal or the continuous signal from said variable frequency oscillator, and

synchronous detection means for receiving said color burst signal and said continuous signal, one of said burst signal and said continuous signal being phase-shifted by said means for phase shifting, for synchronously detecting the peak level of said color burst signal to produce a mmonochromecolor discrimination signal, said discrimination signal being coupled to said first and second color killer circuits for the control thereof.

3,975,760

SOLID STATE CAMERA

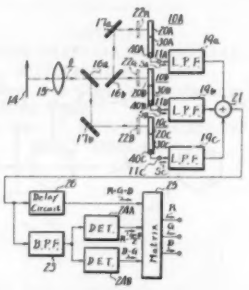
Seisuke Yamanaka, Mitaka; Yasuo Kanou, Tokyo; Tadayoshi Mifune, Yokohama, and Satoshi Shimada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,945

Claims priority, application Japan, Mar. 29, 1974, 49-35277

Int. Cl.² H04N 9/04

U.S. Cl. 358—41 **12 Claims**



1. A solid state camera comprising:

a plurality of image sensors, each having a plurality of picture-sensing units spaced apart by an alignment pitch of τ_H,

means for displaying an image simultaneously on each of said image sensors,

means for displacing the image on each sensor by $\tau H/N$ in a given direction with respect to at least one other of said sensors where N equals the number of image sensors in said camera,

means coupled to said picture sensing units for reading said respective images sequentially in said given direction,

means for shifting the readout times thereof by a time equal to $2\pi/N°$ of the readout frequency, each of said reading means producing an output signal,

means coupled to said reading means for mixing the respective output signals thereof, and

means for deriving an output from said mixing means.

3,975,761

METHOD AND ARRANGEMENT FOR THE AVOIDANCE OF ERRORS DURING THE REPRODUCTION OF AN IMAGE PATTERN

Heinz Taudt, Kiel, and Uwe Gast, Kiel-Rammsee, both of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Kiel, Germany

Filed Mar. 19, 1975, Ser. No. 559,895

Claims priority, application Germany, Mar. 19, 1974, 2413034

Int. Cl.² H04N 1/26

U.S. Cl. 358—78 **10 Claims**

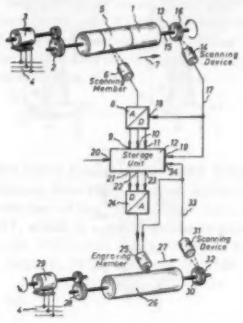
1. In a method for the reproduction of an image pattern disposed on a substantially nonuniformly driven scanning drum, wherein the image pattern is photo-electrically scanned point-by-point and line-by-line to generate an image pattern signal having an analog relationship to the image pattern and the image pattern signal is used to record on at least one recording drum driven substantially nonuniformly and independently of the scanning drum, the improvement comprising:

generating a scanning timing signal in synchronism with the rotational movement of said scanning drum;

converting said image pattern signal to a digital signal in synchronism with said scanning timing signal;

storing said digital signal in a storage unit measure-by-measure in synchronism with said scanning timing signal;

generating a recording timing signal in synchronism with the rotational movement of said recording drum;



reading out said digital signal from said storage unit measure-by-measure in synchronism with said recording timing signal; and, thereafter

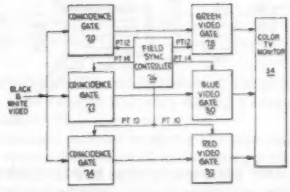
driving at least one recording member with said digital signal to produce an image reproduction on the recording drum.

3,975,762

SPECTROSCOPICAL METHOD AND APPARATUS USING TV SCANNING TECHNIQUES

Francois J. G. van den Bosch, 11 Hillcrest Road, Cedar Grove, N.J. 07009

Filed Apr. 9, 1975, Ser. No. 566,231
Int. Cl.² H04N 9/42
U.S. Cl. 358—81 **5 Claims**



1. Apparatus for reducing the bandwidth of video signal data for display, comprising:

control means for generating sequential first, second and third independent interleaved binary pulse trains, each of said pulse trains including a plurality of control pulses;

first gating means responsive to said first pulse train for generating a first output signal including a selected portion of said video signal data; second gating means responsive to said second pulse train for generating a second output signal including a selected portion of said video signal data other than that portion included in said first output signal;

third gating means responsive to said third pulse train for generating a third output signal including a selected portion of said video signal data other than that portion included in said first and second output signals; and

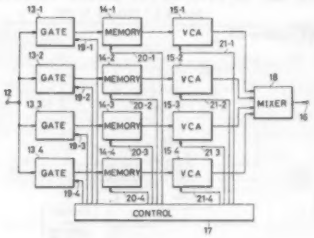
fourth, fifth and sixth gating means for respectively connecting said first, second and and third output signals to respective color guns of a color TV display monitor.

3,975,763

SIGNAL TIME COMPRESSION OR EXPANSION SYSTEM

Masatsugu Kitamura, Fujisawa, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Apr. 29, 1974, Ser. No. 471,715
Claims priority, application Japan, June 4, 1973, 48-61864; May 3, 1973, 48-49292; Apr. 30, 1973, 48-48142
Int. Cl.² G11B 5/00
U.S. Cl. 360—8 **5 Claims**



1. A signal time compression or expansion system comprising:

means for supplying audio signals reproduced from a recording medium at a speed different from that at which the audio signals have been recorded by a recording and reproducing apparatus;

means for generating first clock pulses;

means for generating second clock pulses, the frequency ratio of the first clock pulses to the second clock pulses being equal to the ratio of the speed at which the audio signals are reproduced to the speed at which the audio signals have been recorded;

counter means responsive to the first clock pulses for generating a pulse every specific time interval;

ring counter means responsive to the output pulses of said counter means for producing a plurality of pulse signals having a pulse width equal to the specific time interval, phases of the pulse signals being shifted successively by the pulse width, the plurality being an integer greater than two;

a plurality of gating means which are equal in number to the plurality of pulse signals of said ring counter means, and which receive the supplied audio signals, each of said gating means responsive to the corresponding one of the pulse signals of said ring counter means passing the supplied audio signals during a time interval corresponding to the pulse width of the corresponding pulse signal and interrupting the supplied audio signals during the other time interval;

a plurality of shift registers which are equal in number to the plurality of gating means, and each of which is connected to the corresponding one of the plurality of gating means;

means for applying the first clock pulses to the respective shift registers during time intervals in which the respective corresponding gating means pass the supplied audio signals, to write and store the audio signals in the corresponding shift register, and for applying the second clock pulses to the respective shift registers during time intervals in which the respective corresponding gating means interrupt the supplied audio signals, to read out the audio signals from the corresponding shift register; and

means for mixing the audio signals read out of the shift registers and combining the same into one continuous signal.

3,975,764
TELEVISION SIGNAL RECORDING AND REPRODUCING SYSTEM

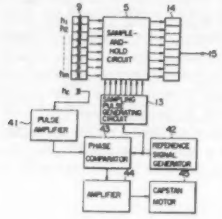
Fukashi Kobayashi; Hiroshi Taniguchi, both of Hirakata, and Kenji Kansi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1974, Ser. No. 512,953

Claims priority, application Japan, Oct. 12, 1973, 48-115224; Oct. 12, 1973, 48-115225; Oct. 12, 1973, 48-115226; Nov. 28, 1973, 48-134752; Nov. 28, 1973, 48-134753; Nov. 28, 1973, 48-134754; Nov. 28, 1973, 48-134755; Nov. 28, 1973, 48-134756; Dec. 19, 1973, 48-143159

Int. Cl.² H04N *5/79*

U.S. Cl. 360—23 **6 Claims**



1. A television signal recording and reproducing system comprising:

means for generating a clock pulse having a frequency which is an $n \times m$ multiple of a horizontal scanning frequency and is phase-locked to the horizontal scanning frequency;

sampling means for sequentially sampling a television signal to be recorded at $n \times m$ points during each horizontal scanning period thereof in response to the clock pulse and for converting said sampled signals into parallel signals;

means for holding said sampled signals for a period of time approximately corresponding to $1/n$ of said horizontal scanning period;

means for recording said held signals on a recording medium on m channels of recording tracks and for reproducing said recorded signals;

means for writing said reproduced signals on an m-channel memory circuit at the same time at the interval of $1/n$ of the horizontal scanning period;

means for reading out said written signals one by one at the interval of $1/m \times n$ of the horizontal scanning period; and

means for synthesizing a continuous television signal from the read out signals.

3,975,765
TAPE RECORDING AND/OR REPRODUCING APPARATUS

Naoki Kamaya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

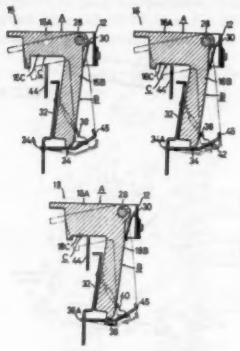
Filed Nov. 27, 1974, Ser. No. 527,515

Claims priority, application Japan, Nov. 30, 1973, 48-135158

Int. Cl.² G11B *15/04*

U.S. Cl. 360—60 **22 Claims**

1. In a tape recording and/or reproducing apparatus having tape supply and takeup reels and means for moving the tape therebetween; means for controlling the mode of operation of the apparatus including, selectively operable means for placing the apparatus in a mode for reproducing signals on the tape; separate selectively operable means for placing the apparatus in a mode for recording signals on the tape; selectively operable means for temporarily and substantially instantaneously stopping movement of the tape when the apparatus is in either the recording or reproducing modes while maintaining said apparatus in said recording or reproducing mode; means for normally preventing operation of said means for placing the apparatus in the recording mode when the apparatus is in the reproducing mode; and release means operatively connected between said stopping means and said preventing



means and operable by said stopping means for releasing said preventing means when the apparatus is in the reproducing mode, thereby to enable said means for placing the apparatus in the recording mode to be operated.

3,975,766
COLOR TELEVISION RECEIVER

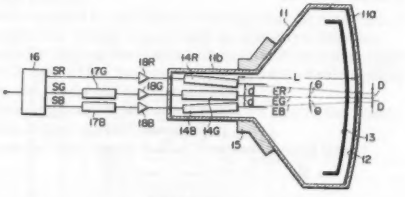
Shunichi Sano, Zama, and Kohichi Kasahara, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Yokohama, Japan

Filed Apr. 29, 1975, Ser. No. 572,645

Claims priority, application Japan, June 25, 1974, 49-72627

Int. Cl.² H04N *9/28;* **H01J** *29/50, 31/00*

U.S. Cl. 358—65 **5 Claims**



1. In a color television receiver having a color television receiving tube with three electron guns having beam-emitting ends to emit three electron beams, and means to modulate each of the three electron beams with a corresponding one of the three primary color television signals applied to the television receiver for impingement onto the fluorescent screen of the television receiving tube, the improvement comprising:

a horizontally spaced arrangement of the three electron guns configured to emit one central electron beam and two side electron beams converging at a point outside of the fluorescent screen,

a deflection yoke associated with the color television receiving tube to provide for scanning of the fluorescent screen by the three electron beams, operative to cause a horizontal deflection magnetic field created by said yoke to have a pincushion-shaped distribution, and a vertical deflection magnetic field produced by said yoke to have a barrel-shaped distribution,

a delay circuit for causing at least two of the said three primary color television signals which modulate the electron beams to be successively delayed from each preceding one for a prescribed length of time, corresponding to

the intervening spacing of the three electron beams impinging onto the fluorescent screen,

the color television receiving tube being designed such that with d (mm) designating the intervening spacing of the three electron beams at the beam-emitting ends of the three electron guns, L (mm) designating the distance from the beam-emitting end of each electron gun to the fluorescent screen, and θ (radian) designating the angle defined by each of the two side electron beams and the central electron beam, the difference $d-L\theta$ is larger than $d/6$ and smaller than $d/2$.

3,975,767

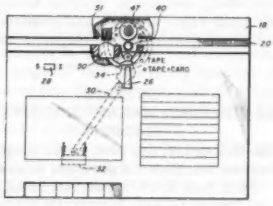
COMBINATION CARD AND TAPE RECORDER

Charles R. Budrose, Box 1057, Saugus, Mass. 01906

Continuation-in-part of Ser. No. 297,947, Oct. 16, 1972, Pat. No. 3,852,817, which is a continuation-in-part of Ser. No. 273,441, July 20, 1972, Pat. No. 3,860,961. This application Sept. 5, 1974, Ser. No. 503,326

Int. Cl.² G11B *15/28, 15/24*

U.S. Cl. 360—88 **9 Claims**



1. An audio recording and reproducing machine capable of handling a tape cassette and card having a magnetic media associated therewith comprising;

a housing having a well for receiving the tape cassette and a member spaced from the well and defining a guide channel having a track for said card to pass along,

mode switch means having a card position, a card and tape position and a tape position,

transport means in the well for driving the tape in the cassette,

cam means connected to said mode switch means and operable therewith to selectively assume either a card position, a card and tape position or a tape position, respectively,

cam follower means contacting said cam means and responsive to operation of the mode switch means to either its tape position or its card and tape position for enabling operation of only the transport means,

drive means adjacent the guide channel for propelling the card through the channel and including a drive capstan and an idler capstan,

means for slidably supporting the idler capstan and including cam follower means contacting said cam means and responsive to operation of the mode switch means to either its card position or its card and tape position for enabling operation of only the drive means by urging the idler capstan toward the drive capstan,

and motor means including means coupling directly to the drive capstan for rotating the drive capstan in all three positions of the mode switch means.

3,975,768

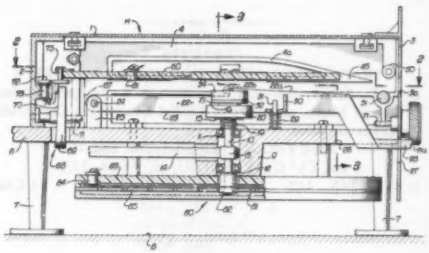
REMOVABLE CARTRIDGE FLEXIBLE DISC MEMORY APPARATUS

James O. Jacques; Barry C. Kockler, both of Longmont, and Frank M. Weller, Jr., Boulder, all of Colo., assignors to Genisco Technology Corporation, Compton, Calif.

Filed June 20, 1973, Ser. No. 371,859

Int. Cl.² G11B *5/016, 23/04*

U.S. Cl. 360—99 **21 Claims**



1. In flexible magnetic disc memory apparatus adapted to receive a flexible disc cartridge having a bottom, a top hinged at the rear of the bottom and a flexible magnetic disc with a hub disposed in an opening in the bottom of the cartridge, said apparatus comprising: a housing having an opening to receive said cartridge, a drive shaft extending into said housing, means for rotating said shaft, coupling means rotatable by said shaft and engageable with the hub of said disc upon insertion of said cartridge into said housing to rotate said disc, a transducer head plate in said housing, and means for opening said cartridge upon insertion of said cartridge into said housing to allow the top and bottom of said cartridge to span said head plate, said opening means including wedge means on opposite side walls of said housing and guide means on said side walls for moving the top of said cartridge away from the bottom of said cartridge, whereby said head plate is disposed between said top and bottom of said cartridge.

3,975,769

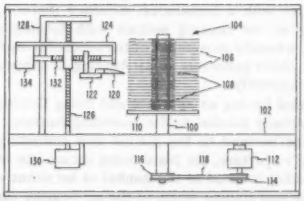
STORAGE DEVICE UTILIZING FLEXIBLE MAGNETIC DISKS

Francis Kong King, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,125

Int. Cl.² G11B *5/82, 17/22, 25/04*

U.S. Cl. 360—99 **5 Claims**



1. A magnetic storage device comprising a spindle; a stack of spaced magnetic flexible disks disposed on and fixed with respect to said spindle; an access arm; said arm having an attachment base portion and a distal end and in cross section having a sharp side edge and a blunt side edge and first and second opposite curved disk complying surfaces connecting said edges; means for moving said arm along the periphery of the stack of disks to a selected location opposite a space between a pair of the disks; means for moving said arm be-

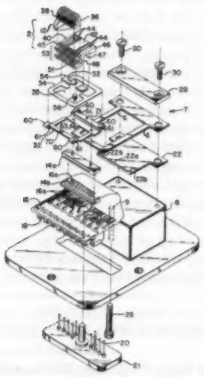
tween said pair of disks to have said curved surfaces lying along the surfaces of said pair of disks; a transducer carried by and embedded in said arm adjacent said distal end and between said blunt and sharp edges and having a portion with a rounded outer surface protruding from one of said curved disk complying arm surfaces; and means for drivingly rotating said spindle and thereby said disks in such direction so that, with said arm lying between said pair of disks, the disks move across said curved surfaces of said arm from said sharp edge to said blunt edge for securing close compliance of one of said pair of disks with said transducer.

3,975,770

TRANSDUCER ASSEMBLY FOR A DISC DRIVE

John L. Spash, Harvard, and Robert Rottmayer, Littleton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 21, 1975, Ser. No. 551,798
Int. Cl.² G11B *5/60, 21/20, 15/64, 21/24*
U.S. Cl. 360—103 **12 Claims**



3. An air bearing transducer asssembly for use with a moving recording surface comprising:

A. a slider with a transducer, mounted thereon, said slider having an air bearing surface with leading and trailing edges, whereby movement of the recording surface relative to the slider generates an air bearing to support the transducer assembly;

B. a gimbal having an aperture and being flexible in a plane substantially parallel to the recording surface;

C. a plate secured to the gimbal and extending across the gimbal's aperture, the plate being secured to the slider;

D. a bracket secured to the gimbal at locations adjacent the leading and trailing edges of the air bearing surface;

E. pivot means extending between the bracket and plate and about which the transducer device may pivot; and

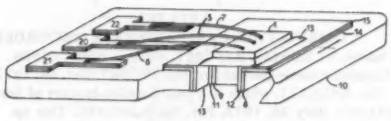
F. means for supporting the bracket to position the air bearing surface adjacent the recording surface, said support means including a pair of leaf springs secured to opposite sides of the bracket, a member spanning the two leaf springs, a support from which the leaf springs cantilever, and means for adjusting the position of the member with respect to the support to deflect the leaf springs.

3,975,771

MAGNETIC HEAD DEVICES ENCLOSED BY A SHIELD HAVING SUPERPOSED LAYERS AND AN INTERVENING LAYER OF SOLDER

Jean-Pierre Lazzari, Villiers Saint Frederic, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Feb. 21, 1974, Ser. No. 444,495
Claims priority, application France, Feb. 21, 1973, 73.06006
Int. Cl.² G11B *5/11, 5/22, 5/48*
U.S. Cl. 360—104 **9 Claims**



1. The combination of:

a magnetic head enclosed in dielectric material,

a dielectric carrier plate provided with a thru-hole in which said head is placed with its airgap face level with the front face of the carrier plate,

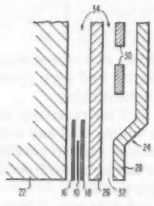
a bonding arrangement of said head within said hole comprising a first thin film of a high permeability anisotropic material bonded to the wall of the hole, a second film of the same high permeability anisotropic material bonded to the surface of the head within said hole and an intervening layer of solder bonding together the two magnetic films.

3,975,772

DOUBLE SHIELDED MAGNETORESTIVE SENSING ELEMENT

Charles Chia-Hsiung Lin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1975, Ser. No. 583,226
Int. Cl.² G11B *5/30;* **B11B** *5/12*
U.S. Cl. 360—113 **13 Claims**



1. A head assembly for reading magnetically recorded information from a medium comprising:

a magnetoresistive element;

means for sensing the resistance of said magnetoresistive element to read the magnetic information from the medium;

a plurality of magnetic sheets forming thin magnetic shields, at least one disposed spaced from and adjacent to each planar surface of said magnetoresistive element;

a plurality of highly permeable magnetic members each having a thickness dimension greater than said thin shields, at least one disposed spaced from and adjacent to said planar surface of said thin shields opposite to the planar surface facing said magnetoresistive element; and

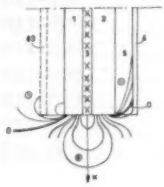
magnetic insulation disposed among said magnetoresistive element, said thin shields and said magnetic members.

3,975,773

THIN FILM MAGNETIC HEADS

Jean-Pierre Dejouhanet, Paris, and Jean-Pierre Lazzari, Montfort l'Amaury, both of France, assignors to Compagnie Internationale pour l'Infomatique, Louveciennes, France

Filed Mar. 10, 1975, Ser. No. 557,036
Claims priority, application France, Mar. 11, 1974, 74.08180
Int. Cl.[2] G11B 5/16, 5/27, 5/14
U.S. Cl. 360—126 8 Claims



1. A thin film magnetic writing head having a frontal air gap face for recording information on a magnetic medium moving adjacent and parallel to said frontal face comprising:

a laminated magnetic flux generating structure including a pair of spaced thin film magnetic pole piece layers having inner and outer faces and end portions defining an air gap there between in said frontal face;

an electrical winding magnetically coupled to and positioned between said pole piece layers;

at least one thin film high permeability magnetic layer having a thickness corresponding to the lowest possible value of its field of anisotropy, overlying, parallel to and spaced from one of said pole pieces; and

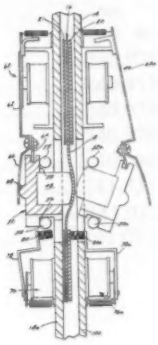
a layer of non-magnetic material positioned between said high permeability layer and said one pole piece, said layer being of a thickness insuring magnetic decoupling between said thin film high permeability magnetic layer and said one pole piece, said one pole piece being the one downstream in the direction of movement of the magnetic medium.

3,975,774

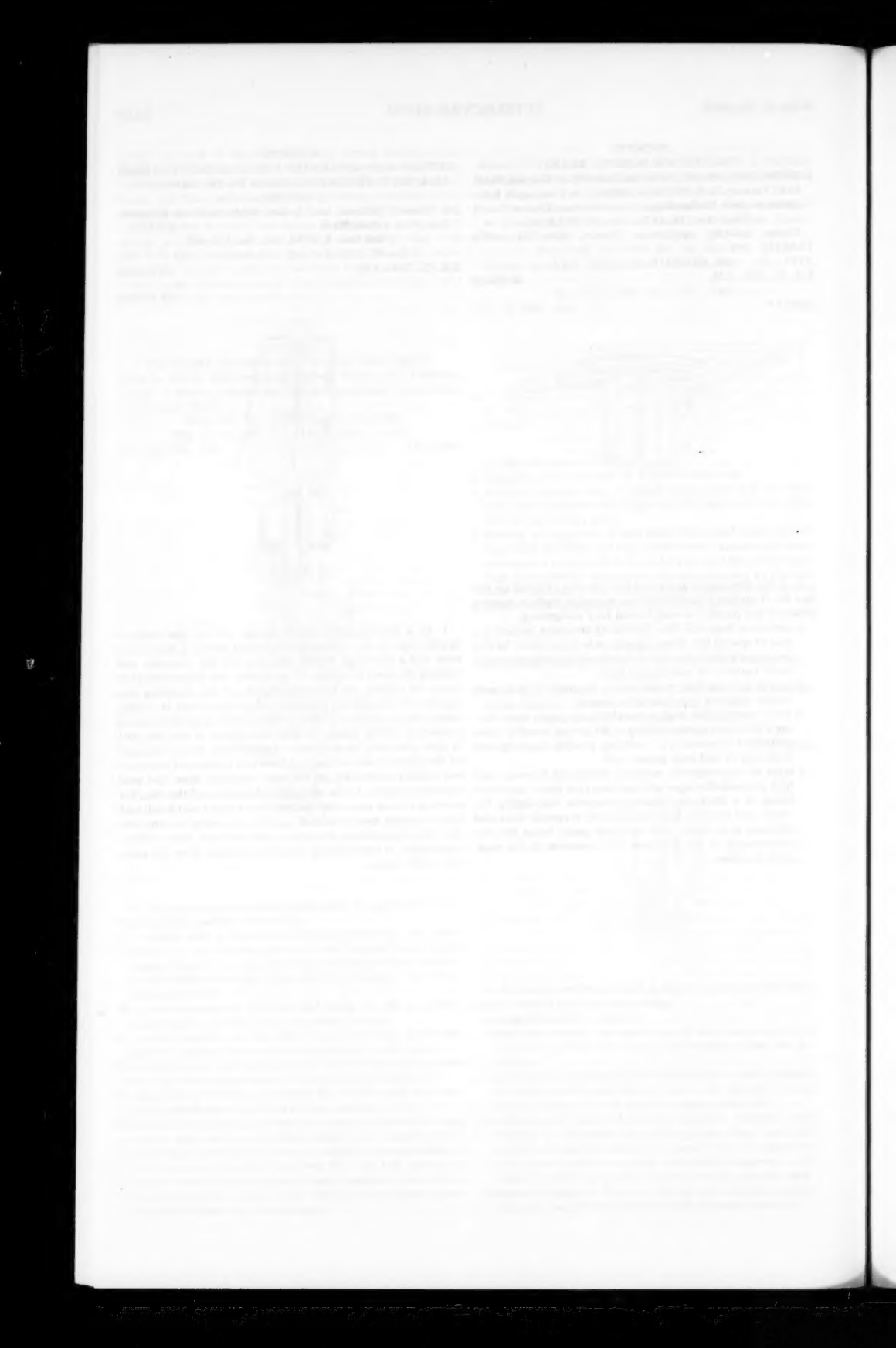
METHOD AND APPARATUS FOR LOADING FLEXIBLE MAGNETIC RECORDING DISCS TO TRANSDUCING HEADS

Jan Hendrik Helbers, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Dec. 4, 1974, Ser. No. 529,489
Int. Cl.[2] G11B 15/62, 5/016, 5/54, 21/22
U.S. Cl. 360—130 19 Claims



1. In a recorder/reproducer device, of the type using a flexible disc as the recording media and having a transducer head and a drive hub means engaging the disc centrally and rotating the same in a plane of revolution, the improvement in means for loading the transducer head and the recording disc together in transducing proximity which comprises in combination: means mounting the transducer head in predetermined position in lateral alignment with the surface of said disc and in close proximity to said plane of revolution; means disposed on the opposite side of said disc from said position of said head and located exclusively in the area extending from the head upstream relative to the direction of rotation of the disc, for exerting a force upon said disc directed toward said head; said force-exerting means located in said area acting to force the disc into transducing proximity with the head even without application of disc-holding force downstream from the position of the head.



DESIGN PATENTS

GRANTED AUGUST 17, 1976

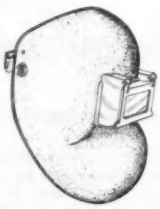
ERRATA

For CLASS	See PATENT NO.
033–009 C	240,976
033–009 C	240,977
033–009 C	240,978
033–009 C	240,979
033–009 C	240,980
025–017	241,031
026–014 E	241,072
016–003	241,073

DESIGNS

AUGUST 17, 1976

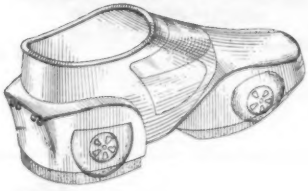
240,970
WELDER'S MASK
Raymond D. Barta, Oakland, Mich., assignor to Airco, Inc., Montvale, N.J.
Filed Sept. 26, 1974, Ser. No. 509,522
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



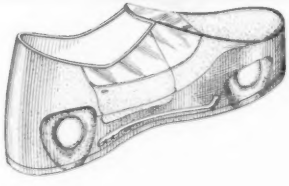
240,971
BOOT
James F. Summa, Naugatuck, and John R. White, Woodbridge, Conn., assignors to Uniroyal, Inc.
Filed Apr. 16, 1975, Ser. No. 569,231
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

240,972
DUAL LACE BOOT
Thomas M. Adams, Box 682, Marble Falls, Tex. 78654
Filed Apr. 28, 1975, Ser. No. 572,616
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275

240,973
SHOE
Stephen V. Tesky, 8S068 Washington St., Westmont, Ill. 60559, and Daniel W. Sokolowski, 8523 S. Tripp Ave., Chicago, Ill. 60652
Filed Jan. 10, 1975, Ser. No. 540,098
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279



240,974
SHOE
Stephen V. Tesky, 8S068 Washington St., Westmont, Ill. 60559, and Daniel W. Sokolowski, 8523 S. Tripp Ave., Chicago, Ill. 60652
Filed Jan. 10, 1975, Ser. No. 540,099
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279



240,975
GLOVE WITH RAISED BACKING
John R. Gregory, 241 W. 35th St., National City, Calif. 92050
Filed May 8, 1975, Ser. No. 575,449
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,976
FABRIC CLOTHING LABEL
Stuart I. Raskas, 24 Westwold Country Club Grounds, St. Louis, Mo. 63131
Filed Dec. 12, 1974, Ser. No. 531,970
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D33—9 C

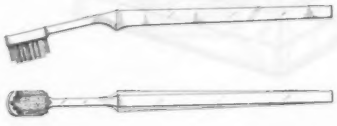
240,977
FABRIC CLOTHING LABEL
Stuart I. Raskas, 24 Westwold Country Club Grounds, St. Louis, Mo. 63131
Filed Dec. 12, 1974, Ser. No. 532,006
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D33—9 C

240,978
FABRIC CLOTHING LABEL
Stuart I. Raskas, 24 Westwold Country Club Grounds, St. Louis, Mo. 63131
Filed Dec. 12, 1974, Ser. No. 532,027
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D33—9 C

240,979
FABRIC CLOTHING LABEL
Stuart I. Raskas, 24 Westwold Country Club Grounds, St. Louis, Mo. 63131
Filed Dec. 12, 1974, Ser. No. 532,037
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D33—9 C

240,980
FABRIC CLOTHING LABEL
Stuart I. Raskas, 24 Westwold Country Club Grounds, St. Louis, Mo. 63131
Filed Dec. 12, 1974, Ser. No. 532,054
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D33—9 C

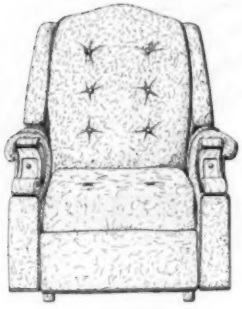
240,981
TOOTHBRUSH
Percy H. Hill, Winchester, and John G. Kreifeldt, Somerville, Mass., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.
Continuation-in-part of abandoned design applications Ser. No. 492,939, July 29, 1974, Ser. No. 574,353, May 5, 1975, and Ser. No. 601,072, Aug. 1, 1975. This application Oct. 3, 1975, Seer. No. 619,196
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



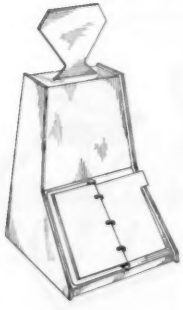
240,982
NECKCHAIN DISPLAY STAND OR SIMILAR ARTICLE
Joseph Antonio Torres, Warwick, R.I., assignor to Textron Inc.
Continuation-in-part of design application Ser. No. 371,124, June 18, 1973. This application Nov. 22, 1974, Ser. No. 526,111
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—20

240,983
DISPLAY STAND
Philip J. Rowman, Hillsboro Park, Derry Road, Hudson, N.H. 03051
Filed June 4, 1973, Ser. No. 366,412
Term of patent 14 years
Int. Cl. D6—*03;* D20—*02*
U.S. Cl. D6—27

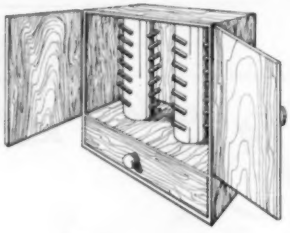
240,984
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Feb. 14, 1972, Ser. No. 226,387
Term of patent 3½ years
The term of this patent subsequent to Feb. 21, 1977, has been disclaimed
Int. Cl. D6—*01*
U.S. Cl. D6—37



240,985
DISPLAY UNIT
Gerald W. Damsky, Merrick, Lawrence Feldman, Long Beach, and James Edward Rohr, Medford, N.Y., assignors to Ev.Game Inc., Freeport, N.N.Y.
Filed Sept. 23, 1974, Ser. No. 508,657
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

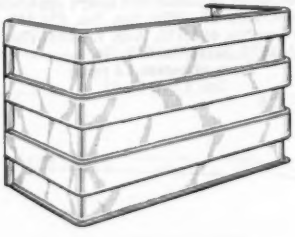


240,986
THREAD CABINET
Jack F. Young, Rte. 3, Box 258, Hope, Ark. 71801
Filed May 13, 1974, Ser. No. 469,512
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



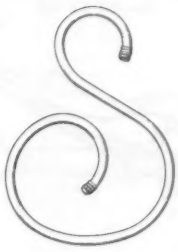
240,987
COLLAPSIBLE ENCLOSURE FOR LAVATORIES OR THE LIKE
Philip A. De Lucia, 57 Lincoln Ave., Cliffside Park, N.J. 07010
Filed Dec. 20, 1974, Ser. No. 534,769
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—181

240,988
EXTERIOR CASING COMPONENT FOR FURNITURE ARTICLES
Lars Gestranius, Wilhelmsro, and Peter Von Knorring, Helsingfors, Finland, assignors to AB Husqvarna Borstfabrik, Huskvarna, Sweden
Filed Sept. 30, 1974, Ser. No. 510,213
Claims priority, application Switzerland Apr. 1, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195



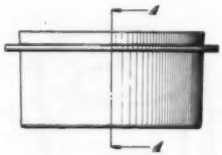
240,989
COAT HANGER
Bruce Bernstein, New York, N.Y., assignor to Handiform Plastic Corp., New York, N.Y.
Filed Jan. 3, 1975, Ser. No. 538,446
Term of patent 3½ years
Int. Cl. D6—*08*
U.S. Cl. D6—247

240,990
HANGER
Bruce Bernstein, New York, N.Y., assignor to Handiform Plastic Corp., New York, N.Y.
Filed Jan. 3, 1975, Ser. No. 538,445
Term of patent 3½ years
Int. Cl. D6—*08*
U.S. Cl. D6—248

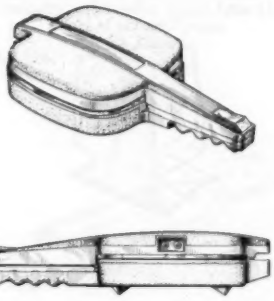


240,991
CUP OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Original design application July 18, 1973, Ser. No. 380,272, now Patent No. 237,031. Divided and this application Dec. 5, 1974, Ser. No. 529,747
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

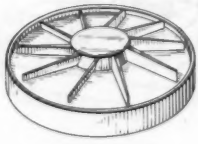
240,992
FOOD MOLDING RING
Richard A. Boucher, Northboro, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 16, 1973, Ser. No. 388,851
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43



240,993
ELECTRIC FOOD COOKER
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Sept. 15, 1975, Ser. No. 613,616
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

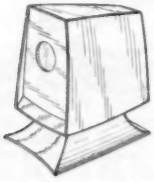


240,994
CORN GRILL
Dye O. Miller, 1815 Pheasant Trail, Mount Prospect, Ill. 60056, and August J. Antunes, 143 E. Jackson, and Jerome Antunes, 397 N. West Ave., both of Elmhurst, Ill. 60126
Filed Aug. 19, 1974, Ser. No. 498,550
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—96



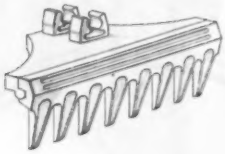
240,995
PORTABLE EXPANDABLE CAMPING GRILL
James E. Hemphill, 1200 Ruth St., Austin, Tex. 78757
Filed Nov. 29, 1974, Ser. No. 528,267
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—136

240,996
HOUSING FOR A MEAT GRINDER, SALAD SHREDDER OR THE LIKE
Alfred W. Madl, Glendale, Wis., assignor to Oster Corporation, Milwaukee, Wis.
Filed July 5, 1974, Ser. No. 485,986
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153



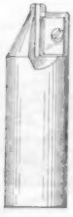
240,997
STEAM AND SPRAY IRON
Hans Joachim Hugo Julkenbeck, Wijnjeterp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 29, 1973, Ser. No. 392,749
Claims priority, application Switzerland Mar. 1, 1973
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—202

240,998
GOLF CLUB RAKE ATTACHMENT
Albert A. Salvatore, 109 Hibiscus Ave., Weymouth, Mass. 02188, and Joseph M. Fucci, 147 Lake St., East Weymouth, Mass. 02189
Filed Apr. 24, 1975, Ser. No. 571,362
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13



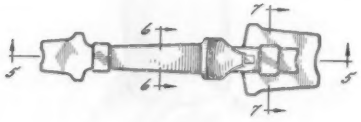
240,999
COMBINED BOTTLE AND CAN OPENER
Andrew D. Hall, David's Hill Road, Bedford Hills, N.Y. 10507
Filed Oct. 24, 1974, Ser. No. 517,735
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—38

241,000
CANDLE SHAPER
Joseph Leigh Smith, 630 Lenox, Glen Ellyn, Ill. 60137
Filed Aug. 8, 1974, Ser. No. 495,547
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

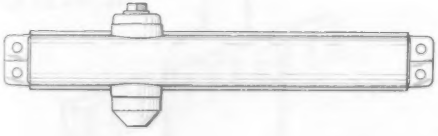


241,001
IDLER PULLEY
Tommy H. Wherry, 104 Baylor, Tyler, Tex. 95701
Filed Feb. 28, 1975, Ser. No. 553,876
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D8—116

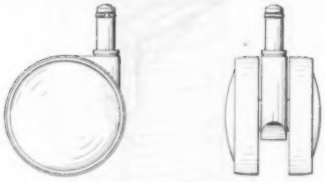
241,002
PULL
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Feb. 3, 1975, Ser. No. 546,214
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—169



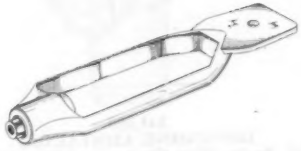
241,003
DOOR CLOSER BODY
Edward Herman Meisner, Wyckoff, N.J., assignor to Eaton Corporation
Filed Oct. 29, 1974, Ser. No. 518,919
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—203



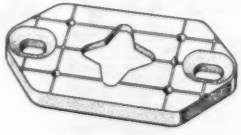
241,004
DUAL WHEEL CASTER
Lon W. Pinaire, Prospect, Ky., and Robert H. Godwin and John M. Freeman, Evansville, Ind., assignors to Bliss & Laughlin Industries, Inc., Oak Brook, Ill.
Filed July 7, 1975, Ser. No. 593,671
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—226



241,005
TURNBUCKLE BODY
Tosiji Asano, Tokyo, Japan, assignor to Asano Bolt Nuts Co., Ltd., Tokyo, Japan
Filed Dec. 4, 1974, Ser. No. 529,474
Claims priority, application Japan June 12, 1974
Term of patent 7 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

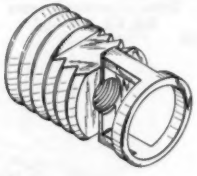


241,006
HANGER BRACKET
Robert S. Wallace, 2881 S. Robertson Blvd., Los Angeles, Calif. 90034
Filed Jan. 30, 1975, Ser. No. 545,326
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—257



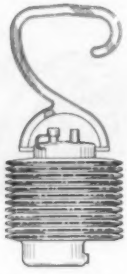
241,007
COMBINED MOLDED WALL FASTENER AND HOOK
Alan J. Solo, Brooklyn, N.Y., assignor to Knock-N-Lok International, Inc., Brooklyn, N.Y.
Filed Dec. 12, 1974, Ser. No. 532,201
Term of patent 14 years
U.S. Cl. D8—271
Int. Cl. D8—*08*

241,008
THREADED INSERT
Edward Di Loreto, Downey, Calif., assignor to Yale Engineering Company, Downey, Calif.
Filed Aug. 18, 1975, Ser. No. 605,695
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—272



241,009
DISPENSING CONTAINER
Joseph E. Brady, West Chester, and Howard E. Curtis, Perkasie, Pa., assignors to American Home Products Corp., New York, N.Y.
Filed Feb. 28, 1975, Ser. No. 554,285
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2

241,010
COMBINED BOTTLE AND CARRYING HANDLE
Edwin L. Adair, 5985 S. Crocker St., Littleton, Colo. 80120
Filed Apr. 3, 1974, Ser. No. 457,495
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10



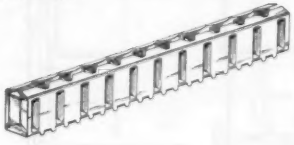
241,011
JAR OR SIMILAR ARTICLE
Floyd E. Pettengill, Lancaster, Ohio, assignor to Green Bay Food Company, Green Bay, Wis.
Filed May 1, 1974, Ser. No. 465,879
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—141

241,012
BOTTLE
Joaquin de Muller y de Abadal, Rambla Generalisimo 38, Tarragona, Spain
Filed June 21, 1974, Ser. No. 481,709
Claims priority, application Spain Apr. 2, 1974
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—151

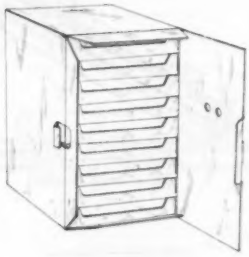
241,013
BOTTLE OR THE LIKE
Evert Jan Dekker, Voorburg, Netherlands, assignor to Indola Cosmetics B.V., Rijswijk (Z.H.), Netherlands
Filed Feb. 4, 1975, Ser. No. 546,892
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—160

241,014
SANDWICH CONTAINER
Charles Calvin Barnhart, Hoffman Estates, Ill., and Carroll W. Cassidy, Fenton, Mo., assignors to Standard Container Company, St. Louis, Mo.
Filed Mar. 15, 1974, Ser. No. 451,575
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—180

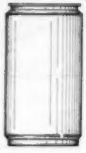
241,015
COMPARTMENTED PACKAGING CONTAINER
Wayne L. Congleton, Whittier, Calif., assignor to Dolco Packaging Corporation
Filed Dec. 26, 1974, Ser. No. 536,505
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184



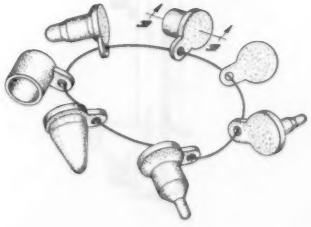
241,016
PACKAGE OF CATERING TRAYS
Marie Reynold, Malmo, Sweden, assignor to Reynolds Grafiska AB, Malmo, Sweden
Filed Nov. 8, 1973, Ser. No. 414,132
Claims priority, application Great Britain May 11, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



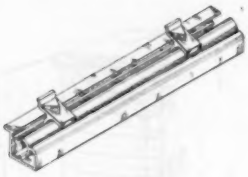
241,017
CAN OR THE LIKE
Charles T. Baker, Rutland, Vt., assignor to Vermont Marble Company, Proctor, Vt.
Filed Oct. 17, 1974, Ser. No. 515,537
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



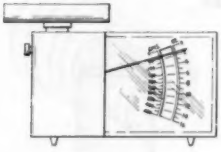
241,018
CLOSURE PLUG SET
Ferdinando De Amicis, 6641 Upton Ave. S., Minneapolis, Minn. 55423
Filed May 17, 1974, Ser. No. 470,997
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—281



241,019
DRAPERY PLEATER GAUGE
Orlando A. Chadwick, Denver, Colo., assignor to Chadco, Inc., Denver, Colo.
Filed Feb. 19, 1975, Ser. No. 551,166
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62

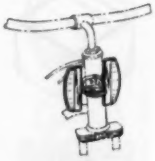


241,020
SCALE FOR COMPUTING CALORIES OF FOOD
Samuel J. Koch, % Korex Industries, 821 Malcolm Road, Burlingame, Calif. 94010
Filed Jan. 20, 1975, Ser. No. 542,440
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



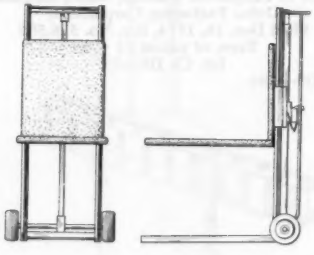
241,021
FLOW METER
Eigel J. Bacino, Huntington Valley, and Gary K. Porter, Warrington, Pa., assignors to Porter Instrument Company, Inc., Hatfield, Pa.
Filed Mar. 3, 1975, Ser. No. 554,577
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

241,022
BICYCLE REFLECTOR
Richard A. Disbrow, 410 Arcadia Blvd., Battle Creek, Mich. 49017
Filed June 13, 1975, Ser. No. 586,815
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

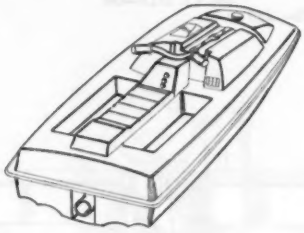


241,023
TIMEPIECE DIAL COVER
Peter R. Haas, Minusio, Switzerland, assignor to Sindaco S.A.
Filed Jan. 22, 1975, Ser. No. 543,001
Claims priority, application Switzerland July 29, 1974
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—132

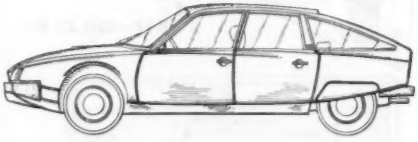
241,024
APPLIANCE PORTABLE LIFTER
Larry M. Lantz, 563 Harrison, Pawnee, Okla. 74058, and William L. Mitchell, 321 7th St., Perry, Okla. 73077
Filed Apr. 26, 1974, Ser. No. 464,528
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—56



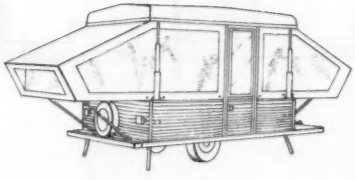
241,025
JET POWERED AQUATIC VEHICLE
Clayton J. Jacobson, 3500½ Highland, Manhattan Beach, Calif. 90266
Filed June 2, 1975, Ser. No. 582,851
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—69



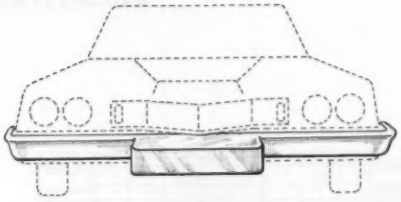
241,026
AUTOMOBILE
Boris Gonzalez, Issy-les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Nov. 4, 1974, Ser. No. 520,935
Claims priority, application France May 21, 1974
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



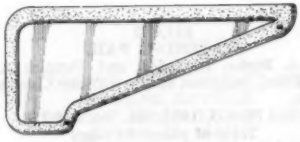
241,027
CAMPER TRAILER
William F. Cox, Grifton, N.C. 28530
Filed Dec. 24, 1974, Ser. No. 536,167
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—104



241,028
WHEEL BUMPER
Cheston Lee Eshelman, 621 NE. 30th Terrace, Miami, Fla. 33137
Continuation-in-part of abandoned design application Ser. No. 479,883, June 17, 1974. This application May 16, 1975, Ser. No. 578,191
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

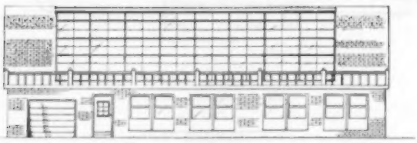


241,029
SPLASH GUARD
Robert G. Bode, 5664 N. Natoma Ave., Chicago, Ill. 60631
Filed Sept. 22, 1975, Ser. No. 615,674
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185

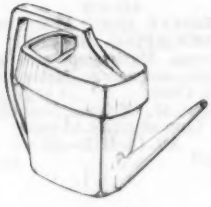


241,030
VEHICLE DOOR MIRROR MOUNTING BRACKET
Joseph R. Bourassa, Huntington, and Manuel Lopez, Trumbull, Conn., assignors to Parker-Hannifin Corporation, Shelton, Conn.
Filed Sept. 13, 1974, Ser. No. 505,733
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

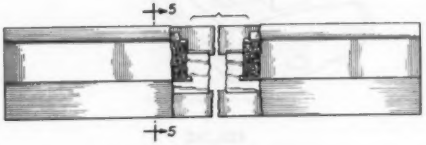
241,031
SOLAR HOUSE
Harry E. Thomason and Harry Jack Lee Thomason, Jr., both of 6802 Walker Mill Road SE., Washington, D.C. (District Heights, Md., branch), 20027
Filed Dec. 16, 1974, Ser. No. 533,212
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17

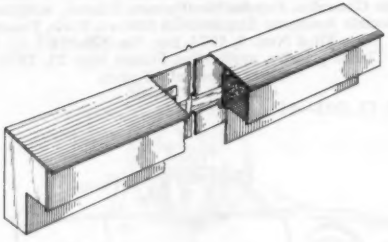


241,032
WATERING PAIL
Frederick A. Burke, Riverside, and Douglas A. Long, Wilton, Conn., assignors to The Gillette Company Boston, Mass.
Filed Nov. 3, 1975, Ser. No. 628,218
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11



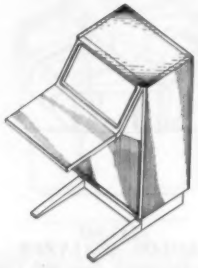
241,033
AGRIBUILDING AIR INTAKE
George E. France, Oswego Township, Kendall City, Ill. (901 W. James St., Geneva, Ill. 60134)
Continuation-in-part of design application Ser. No. 251,601, May 8, 1972, now Patent No. 232,310. This application Aug. 6, 1974, Ser. No. 495,182
Term of patent 14 years
The term of this patent subsequent to Aug. 6, 1988, has been disclaimed
Int. Cl. D23—*04*
U.S. Cl. D23—139



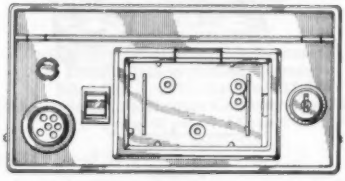


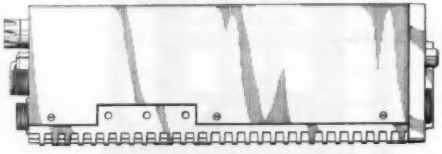
241,034
TELEPHONE PLUG OR SIMILAR ARTICLE
Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems, Syosset, N.Y.
Filed Oct. 23, 1974, Ser. No. 517,099
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

241,035
DISPLAY MODULE OR SIMILAR ARTICLE
James H. Karlin, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 22, 1974, Ser. No. 526,185
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



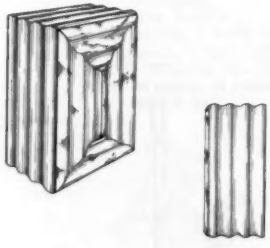
241,036
HOUSING FOR A VEHICULAR RADIO COMMUNICATION SYSTEM
Gene T. Brown, 2233 Cindy Court 32808, and William B. Thompson, 3713 E. Kaley Ave. 32806, both of Orlando, Fla.
Filed July 23, 1974, Ser. No. 490,932
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K





241,037
POCKET DICTATING MACHINE
Henricus Franciscus Theresia Schellens, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation-in-part of design application Ser. No. 405,488, Oct. 11, 1973. This application Sept. 25, 1975, Ser. No. 616,542
Claims priority, application Switzerland Apr. 16, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

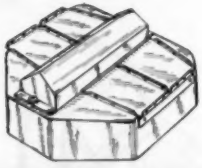
241,038
LOUDSPEAKER CABINET OR SIMILAR ARTICLE
William T. Hibdon, 1212 W. Lill, Chicago, Ill. 60614
Filed Nov. 17, 1975, Ser. No. 632,250
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—01



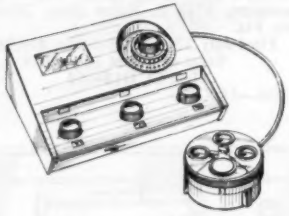
241,039
LIGHTER-PEN COMBINATION WITH MAGNETIZED TELESCOPIC TIP
Taro Yanai, 13–4, Shirakawa 1-chome, Koto-ku, Tokyo, Japan
Filed Dec. 19, 1974, Ser. No. 534,485
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

241,040
LIGHTER WITH MAGNETIZED TELESCOPIC TIP
Taro Yanai, 13–4, Shirakawa 1-chome, Koto-ku, Tokyo, Japan
Filed Dec. 19, 1974, Ser. No. 534,484
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—38

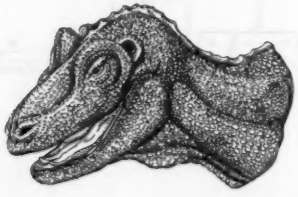
241,041
ANIMAL WATERER
Orville R. Bohlmann, Box 344, Denison, Iowa 51442
Filed Feb. 24, 1975, Ser. No. 552,254
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



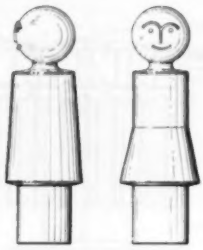
241,042
COLOR ANALYZER
John M. Kupiec, Demarest, N.J., and Eugene Goldberg, Brooklyn, N.Y., assignors to Berkey Photo, Inc., Woodside, N.Y.
Filed Jan. 10, 1975, Ser. No. 540,233
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D32—2 C



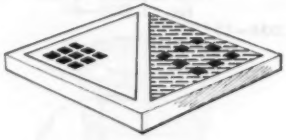
241,043
HAND PUPPET IN THE FORM OF A DRAGON'S HEAD
Michael Bacarella, Jr., 200 N. Lima, Burbank, Calif. 91505
Filed Feb. 18, 1975, Ser. No. 550,716
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



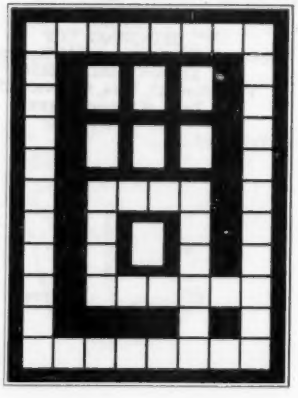
241,044
FIGURINE TOY OR THE LIKE
Robert H. C. M. Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 23, 1975, Ser. No. 543,588
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



241,045
COMBINED GAME PIECES AND HOLDER
Julian J. Hendlin, 1204 Calle del Sol, Santa Barbara, Calif. 93101
Filed Jan. 2, 1973, Ser. No. 320,201
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP

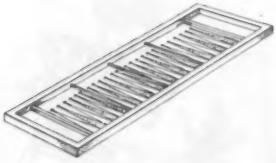


241,046
GAME BOARD
Margarethe Plaumann, Schuberstrasse 1, D–6450 Hanau (Main), Germany
Filed Oct. 2, 1974, Ser. No. 511,394
Claims priority, application Germany Apr. 10, 1974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

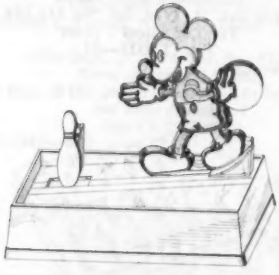


241,047
PLAYGROUND ROPE SWING OR THE LIKE
Vernon L. Ryan, 6802 Milliken Ave., Austin, Tex. 78723
Filed Oct. 4, 1974, Ser. No. 512,301
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 M

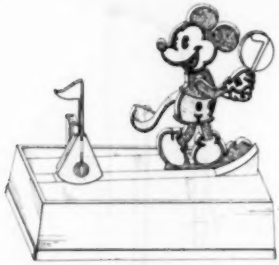
241,048
BACKGAMMON BOARD
Bruce G. Zemby, 1211 Abrigo Road, Palm Springs, Calif. 92262
Filed Feb. 18, 1975, Ser. No. 550,540
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



241,049
TOY BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,861
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D34—11 R

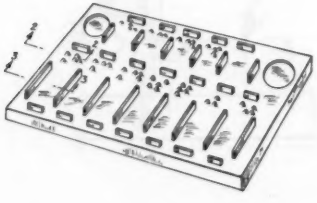


241,050
TOY BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,862
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D34—11 R

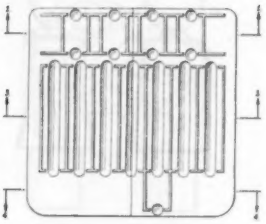


241,051
TOY BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,866
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D34—11 R

241,052
SOLITAIRE GAME BOARD
Donald L. Brown, 12374 Maple View St., Space 51, Lakeside, Calif. 92040
Filed Oct. 21, 1974, Ser. No. 516,254
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A

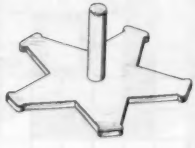


241,053
SOLITAIRE GAME BOARD
Stanley C. Stockton and Mary J. Stockton, both of 108 Cartwell Drive, Apt. 201, Virginia Beach, Va. 23452
Filed May 19, 1975, Ser. No. 577,057
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A



241,054
TOY CONSTRUCTION PIECE
Guy Fortier, 1233 Route de l'Eglise, Ste-Foy, Quebec, G1W 3P2, Canada
Filed Oct. 15, 1974, Ser. No. 514,777
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG

241,055
SPINNING TOP
Robert C. Wohlstrom, 25231 Romera Place, El Toro, Calif. 92630
Filed Nov. 27, 1974, Ser. No. 527,898
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 AH

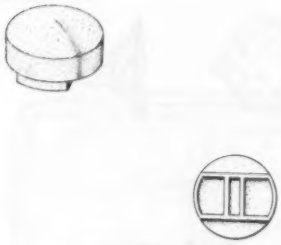


241,056
FLYING TOY
Davey L. Langston, 3616 Mount Vernon, Fort Worth, Tex. 76103
Filed Feb. 25, 1975, Ser. No. 552,941
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 W

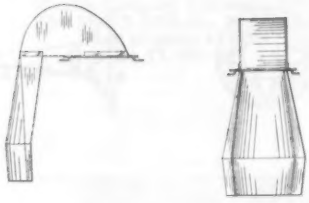
241,057
PLANT POT
Robert G. Hartman, Reidsville, N.C., assignor to Zarn Inc., Reidsville, N.C.
Filed Feb. 5, 1975, Ser. No. 547,176
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

241,058
FLOWER POT
Frederick A. Burke, Riverside, Conn., Joel A. Farrell, Carlisle, Mass., and Douglas A. Long, Wilton, Conn., assignors to The Gillette Company, Boston, Mass.
Filed Aug. 13, 1975, Ser. No. 604,105
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

241,059
ONE-PIECE CYLINDER LAP TOOL
Carl Young, Anniston, Ala., assignor to EDI Corporation, Talladega, Ala.
Filed Mar. 6, 1975, Ser. No. 556,051
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D37—1 R

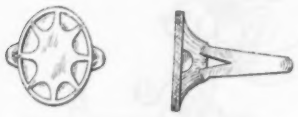


241,060
LAWN MOWER GRASS CATCHER CHUTE
Victor Leader, Minneapolis, Minn. (21324 Lake George Drive NW., Cedar, Minn. 55011)
Filed May 1, 1975, Ser. No. 573,454
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 A



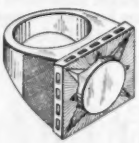
241,061
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc.
Filed Sept. 27, 1974, Ser. No. 510,066
Term of patent 14 years
The term of this patent subsequent to July 20, 1990, has been disclaimed
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

241,062
FINGER RING
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Filed Dec. 19, 1974, Ser. No. 534,184
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B



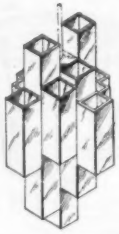
241,063
FINGER RING
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Filed Feb. 7, 1975, Ser. No. 548,075
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B

241,064
FINGER RING
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Filed Feb. 7, 1975, Ser. No. 548,076
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B

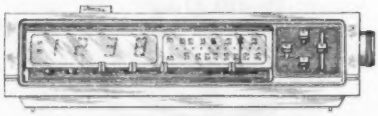


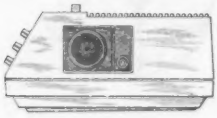
241,065
PENDANT OR SIMILAR ARTICLE
Margaretta C. Roberts, Providence, R.I., assignor to Reed and Barton Corporation, Taunton, Mass.
Filed May 28, 1974, Ser. No. 473,517
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D45—16 B

241,066
LIGHTING FIXTURE
Arthur Schacht, East Hills, N.Y., assignor to Crystal Mart, Inc., Deer Park, N.Y.
Filed Oct. 31, 1974, Ser. No. 519,767
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

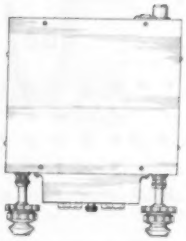


241,067
CLOCK RADIO
John T. Houlihan, Fayetteville, N.Y., assignor to General Electric Company
Filed Dec. 4, 1974, Ser. No. 529,331
Term of patent 14 years
Int. Cl. D10—*01*; D14—*03*
U.S. Cl. D56—4 B

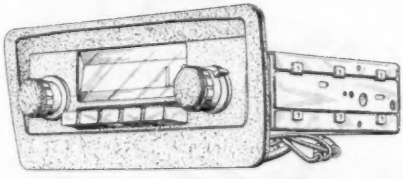




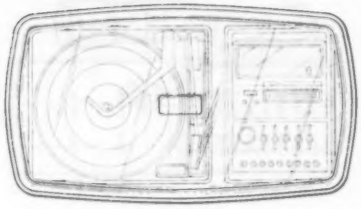
241,068
COMBINED TRANSCEIVER AND RADIO
Kazuo Kawasaki, Kitakata, Japan, assignor to Nissan Denshi Kabashikigaisha
Filed Dec. 16, 1974, Ser. No. 533,005
Claims priority, application Japan Nov. 12, 1974
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



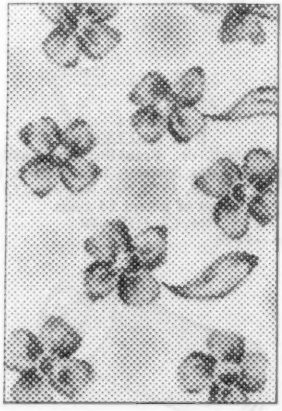
241,069
CAR RADIO
Ulf Angelo Sandberg, Goteborg, Sweden, assignor to AB Volvo, Goteborg, Sweden
Filed Feb. 19, 1975, Ser. No. 550,938
Claims priority, application Sweden Aug. 19, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



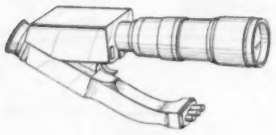
241,070
COMBINED PHONOGRAPH AND CARTRIDGE PLAYER
Falkon S. Davis, Berkeley Heights, N.J., assignor to Brother International Corporation, New York, N.Y.
Continuation-in-part of abandoned design application Ser. No. 387,778, Aug. 13, 1973. This application Apr. 23, 1975, Ser. No. 570,665
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



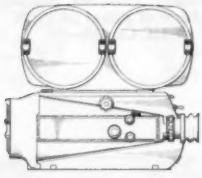
241,071
SHEET OF PAPER TOWELING
K. Clark Pester, Cincinnati, Ohio, assignor to Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 7, 1974, Ser. No. 448,931
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



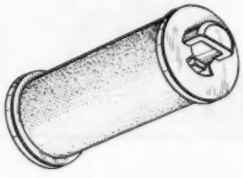
241,072
TELEVISION CAMERA
Renville H. McMann, Jr., New Canaan, Conn., Clyde W. Smith, North Salem, N.Y., and John C. Wistrand, New Canaan, Conn., assignors to Thomson-CSF Laboratories, Inc.
Filed Nov. 29, 1974, Ser. No. 528,129
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 E



241,073
MOTION PICTURE CAMERA
Jacob G. Monroy, 1038 N. Highland Ave., Hollywood, Calif. 90038
Filed May 12, 1975, Ser. No. 576,865
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—3

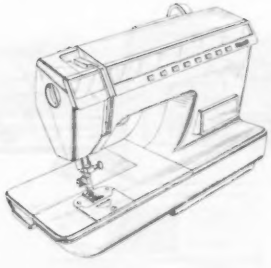


241,074
INK ROLLER
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Oct. 25, 1974, Ser. No. 518,113
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R

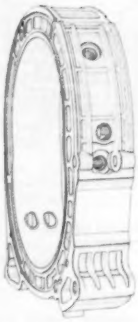


241,075
FONT OF SCRIPT
William J. Gray, Red Bank, N.J., assignor to Norcross, Inc., Westchester, Pa.
Filed Feb. 24, 1975, Ser. No. 552,670
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—17

241,076
SEWING MACHINE FRAME OR SIMILAR ARTICLE
Donald M. Genaro, Haworth, N.J., and Cristian J. Felix, Flushing, N.Y., assignors to The Singer Company
Filed Dec. 27, 1974, Ser. No. 537,040
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1

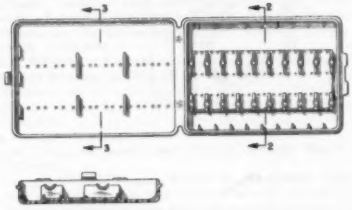


241,077
INTERNAL COMBUSTION ROTARY ENGINE ROTOR HOUSING
Raymond J. Green, Northville, and Gordon D. Corrigan, Livonia, Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation-in-part of abandoned design application Ser. No. 478,956, June 13, 1974. This application Nov. 21, 1974, Ser. No. 525,996
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 A

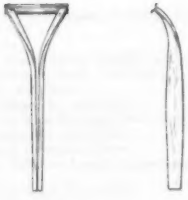


241,078
INTRA-UTERINE DEVICE FOR CONTRACEPTION
Tadao Okamoto and Takeo Komamura, Tokyo, and Atsumi Ishihama, Morioka, Iwate-ken, Japan, assignors to Fuji Latex Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1975, Ser. No. 547,490
Claims priority, application Japan Dec. 26, 1974
Term of patent 14 years
Int. Cl. D24—*02*
US.. Cl. D83—12 R

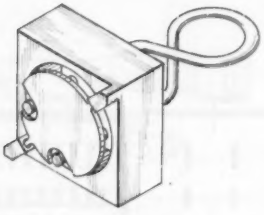
241,079
POCKET CARTRIDGE CASE
William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio
Filed Apr. 1, 1975, Ser. No. 564,076
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



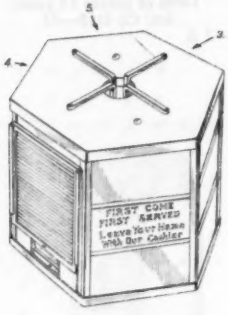
241,080
RAZOR HANDLE
Martin Glaberson, Stratford, Conn., assignor to Warner-Lambert Company
Filed Apr. 18, 1975, Ser. No. 569,234
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



241,081
DISPLAY ELEMENT FOR FORMING INDICIA IN A SIGN
Donald Winrow, Weston, Ontario, Canada, assignor to Ferranti-Packard Limited
Filed June 20, 1974, Ser. No. 481,151
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 K



241,082
ROTATING MESSAGE HOLDER
Fred R. Hubble, Nappanee, Ind., assignor to Tyme and Tydings Inc., Nappanee, Ind.
Filed Nov. 7, 1974, Ser. No. 521,565
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF AUGUST, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Lewis, Paul E., 3,975,580.

A. Duda and Sons: *See—*
Boots, Vernie A., 3,974,725.

A. E. Staley Manufacturing Company: *See—*
Lotzgesell, James A.; Moser, Kenneth B.; and Hurst, Thomas L., 3,975,206.

A.H.P., Inc.: *See—*
Taylor, Gregg W., 3,975,158.

A. H. Robins Company, Incorporated: *See—*
Welstead, William John, Jr.; and Moran, Henry Wayne, 3,975,531.

A-Lok Corporation: *See—*
Ditcher, John, 3,974,615.

A/S Dansk Metal- & Armaturindustri: *See—*
Nielsen, Ove Hjortborg, 3,974,858.

A. Schild S.A.: *See—*
Gilomen, Beat; and Schaller, Kurt, 3,974,639.

AB Akerlund & Rausing: *See—*
Benzon-Petersen, Boye Ditlef, 3,974,957.

Abarotin, Eugene V.; and Buckiso, Michael A., to United States Steel Corporation. Bits for ingot tongs. 3,975,045, Cl. 294-86.00R.

Abe, Kiyomi: *See—*
Miyazaki, Kazuhide; and Abe, Kiyomi, 3,975,498.

Abe, Michio; and Urokohara, Tomio. Fluid flow control valve. 3,974,869, Cl. 251-309.000.

Abel, James R.: *See—*
Mitchell, Harry R.; Rice, Hal H.; and Abel, James R., 3,974,650.

Ace Controls, Inc.: *See—*
Chorkey, William J., 3,975,007.

ACF Industries, Incorporated: *See—*
Josephson, Edgar F., 3,974,781.

Acher, Jacques: *See—*
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 3,975,434.

Adams, Andrew Borden, Jr. Guitar strut assembly. 3,974,730, Cl. 84-291.000.

Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, to American Cyanamid Company. Insecticidal 2-imino-1,3-dithietane derivatives. 3,975,528, Cl. 424-263.000.

Addressograph Multigraph Corporation: *See—*
Anderson, Carl E., 3,975,118.
Jantzen, Johannes Kristoffer, Jr., 3,974,582.
Pick, George G., 3,975,745.

Adler, Dani: *See—*
Adler, Shaul; and Adler, Dani, 3,975,722.

Adler, Shaul; and Adler, Dani. Protective alarm system. 3,975,722, Cl. 340-261.000.

Aeronutronic Ford Corporation: *See—*
Ringer, Hayden N., 3,975,729.

Aeroplane & Motor Aluminium Castings Limited: *See—*
Bolton, Albert Edward, 3,974,997.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Fradin, Maurice, 3,975,548.

Agency of Industrial Science & Technology: *See—*
Fujii, Shozo; and Inukai, Kan, 3,975,424.
Fujishige, Shoei; and Suzuki, Mitsuo, 3,975,328.

AGFA-Gevaert, A.G.: *See—*
Hofmann, Wilfried; Dietrich, Karl-Heinz; Rauffer, Walter; Schuhmeir, Eugen; and Kohler, Reinhard, 3,975,749.

AGFA-GEVAERT N.V.: *See—*
Van Engeland, Jozef Leonard; and Willem, Arnold August, 3,975,626.

Aikoh Co., Ltd.: *See—*
Takashima, Masaru, 3,975,200.

Air Products and Chemicals, Inc.: *See—*
Doelp, Louis C., 3,975,259.
Heiberger, Charles A., 3,975,321.

Airco, Inc.: *See—*
Nayar, Harbhajan S., 3,975,193.

Aisin Seiki Kabushiki Kaisha: *See—*
Kondo, Toshiyuki; and Nishimura, Takumi, 3,975,061.
Ohmi, Atsushi, 3,974,751.

Akeel, A. Hadi K.; Gmurowski, Romuald; and Wasserbaech, Eberhard E., to General Motors Corporation. Chuck with dual independently actuable sets of jaws. 3,975,030, Cl. 279-4.000.

Akers, Ronald R., to Westinghouse Electric Corporation. Method and apparatus for production of high quality powders. 3,975,184, Cl. 75-.50B.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See—*
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, 3,975,607.
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, 3,975,608.

Albert, James R.: *See—*
Kodama, Jiro K.; Haynes, George R.; and Albert, James R., 3,975,533.

Albert, Willard S.; and Colaiaco, August P., to Westinghouse Electric Corporation. Earthquake resistant switchgear. 3,975,603, Cl. 200-301.000.

Albertazzi, Gastone, to Finike Italiana Marposs-Soc. In Accomandita Semplica di Mario Possati & C. Automatic station for measuring the sizes of mechanical workpieces. 3,974,569, Cl. 33-143.00R.

Alco Foodservice Equipment Company: *See—*
Rekesius, John F., 3,974,759.

Alexandrov, Adolf Moritsovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Allemand, Robert, to Commissariat a l'Energie Atomique. Particle localization detector. 3,975,639, Cl. 250-385.000.

Allen, Bobbie J.: *See—*
McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., 3,975,433.

Allen & Hanburys Limited: *See—*
Harper, Norman James; and Veitch, George Bryan Austin, 3,975,443.

Allen, Kenneth C.; and Rogers, Robert M., to Hobart Corporation. Computing weighing scale with optional sale by unit label printing with no goods on the weighing platform as precondition. 3,974,887, Cl. 177-4.000.

Allen, Marvin Martin; Miller, John Alois; and Woodings, Bruce Edward, to United Technologies Corporation. Thermomechanical treatment for nickel base superalloys. 3,975,219, Cl. 148-11.50P.

Allied Chemical Corporation: *See—*
Baumgaertner, Eugene R., 3,975,481.
Bollen, Philip Stuart; and Amin, Surendra A., 3,975,355.
Bollen, Phillip Stuart; Amin, Surendra A.; and Sacks, William, 3,975,485.
Gordon, Joseph; and Sukornick, Bernard, 3,975,501.

Allied Colloids Limited: *See—*
Smalley, Graham; and Rothwell, Eric, 3,975,496.

Allis-Chalmers Corporation: *See—*
Breed, Michal A.; and Marsch, James E., 3,974,717.

Allison, William D., to Ford Motor Company. Torsion bar spring suspension. 3,975,038, Cl. 280-700.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, 3,975,685.

Aluminium Pechiney: *See—*
Cerles, Georges; and Bitsch, Robert, 3,974,572.

Aluminum Company of America: *See—*
Bergmann, Werner J.; and Worden, John A., 3,974,955.
Haupin, Warren E.; and Luffy, John W., 3,975,212.
Racunas, Bernard J.; and Kastelic, Raymond, 3,975,149.

Alvarez, Francisco, to Syntex Corporation. Process for preparing 2-(6-methoxy-2-naphthyl)propionic acid. 3,975,432, Cl. 260-520.00R.

Amadori, Ekkehard: *See—*
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, 3,975,527.

Amann, August: *See—*
Reicheneder, Franz; Kropp, Rudolf; Amann, August; Giertz, Hubert; and Schuster, Joerg, 3,975,526.

Amchem Products, Inc.: *See—*
Rodzewich, Edward A., 3,975,215.

American Chain & Cable Company, Inc.: *See—*
Johnson, Richard B., 3,974,909.

American Cyanamid Company: *See—*
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 3,975,528.
Behrens, Rudolf Adolf, 3,975,324.
Kaplan, Earl, 3,975,296.
Mina, George Louis; and Erjavec, John, 3,975,394.
Stretanski, Joseph Anthony, 3,975,358.

American Flange & Manufacturing Co., Inc.: *See—*
Moller, Thomas G., 3,974,931.

American Home Products Corporation: *See—*
Fletcher, Horace; Malis, Jerry L.; and Yardley, John P., 3,975,436.
Stein, Reinhardt P., 3,975,412.
Strike, Donald P.; and Kao, Wenling, 3,975,421.

American Hospital Supply Corporation: *See—*
Moore, Robert R.; and Eitzen, Vincent E., 3,975,001.

American Locker Company, Inc.: *See—*
Stackhouse, Wells F., 3,974,669.

American Micro-Systems, Inc.: *See—*
Erickson, Bruce G., 3,975,678.
Rodgers, Thurman J., 3,975,221.

American Optical Corporation: *See—*
Shoemaker, Arthur H., 3,975,087.
Shoemaker, Arthur H., 3,975,088.
Upton, Lee O., 3,975,092.
Upton, Lee O., 3,975,093.

American Potato Company: *See—*
Shatila, Mounir A.; and Beck, Roderick G., 3,975,549.
Shatila, Mounir A., 3,975,551.

American Sterilizer Company: *See—*
Delang, Theodore G., 3,974,956.

American Store Equipment Corporation: *See—*
Logie, Charles F., 3,974,610.

AMF Incorporated: *See—*
Sherwood, John R., 3,975,262.
Wireman, Jack; and Kazares, Richard Elliott, 3,975,126.

Amin, Surendra A.: *See—*
Bollen, Philip Stuart; and Amin, Surendra A., 3,975,355.
Bollen, Phillip Stuart; Amin, Surendra A.; and Sacks, William, 3,975,485.

Ammon, John Preston, to Elfab Corporation. Low profile integrated circuit connector and method. 3,975,072, Cl. 339-17.0LC.

Ammon, John Preston, to Elfab Corporation. Folded electrical contact. 3,975,078, Cl. 339-221.00M.

Anderson, Carl E., to Addressograph Multigraph Corporation. Non-contacting shaft seal. 3,975,118, Cl. 417-424.000.

Anderson, Larry E.: *See—*
Kroger, Richard A.; and Anderson, Larry E., 3,975,688.

Anderson, Richard C., to United States of America, Navy. Aerosol synthesis of ceramic powders. 3,975,290, Cl. 252-301.10R.

Anderson, Roy S.; and Pendleton, John F., to Borg-Warner Corporation. Epoxidized copolymers. 3,975,332, Cl. 526-15.000.

Anderson, Winton C.: *See—*
Lane, Marvin K.; and Anderson, Winton C., 3,975,320.

Ando, Yoshikazu: *See—*
Yoshino, Zenzaburo; Ando, Yoshikazu; and Yokozato, Junichi, 3,975,750.

Andresen, John H., Jr., to E-P Products, Inc. Thermostat. 3,975,703, Cl. 337-374.000.

Angelini, Dominic J.; and Perry, Philip G., to Xerox Corporation. Electrode for measuring thickness of dielectric layers on conductive substrates. 3,975,681, Cl. 324-71.00R.

Angileri, Benjamin T.: *See—*
Bodeen, Joseph J., 3,974,827.

Antemann, Joachim: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. High voltage diodes. 3,975,213, Cl. 148-1.500.

Anti-Pollution Systems, Inc.: *See—*
Greenberg, Jacob, 3,974,784.

Aoyagi, Takaaki: *See—*
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,975,366.

Aoyama, Takami: *See—*
Mizutani, Kunihiko; Aoyama, Takami; and Kawamura, Kazuhiro, 3,975,125.

Appel, Ulrich, to International Business Machines Corporation. Loss signal generation for delta-modulated signals. 3,975,686, Cl. 325-38.00B.

Applegate, Paul A. Crop combine with a resiliently mounted crop separator. 3,974,837, Cl. 130-27.00S.

Appleton, Arthur I. Modular electrical switch with split housing. 3,975,604, Cl. 200-303.000.

Applicon Incorporated: *See—*
Carvey, Philip P., 3,975,592.

Applied Photophysics Limited: *See—*
West, Michael Anthony, 3,975,098.

Arcari, Giuliana; De Micheli, Pietro; Luini, Fulvio; and Scarponi, Ugo, to Societa' Farmaceutici Italia S.p.A. Caffeine derivatives. 3,975,389, Cl. 260-254.000.

Arimura, Ichiro: *See—*
Taniguchi, Hiroshi; and Arimura, Ichiro, 3,975,759.

Arimura, Tohru: *See—*
Kawawa, Takaho; Arimura, Tohru; and Okado, Masaru, 3,974,559.

Aring, John Alan, to Boeing Company, The. Anchor cradle apparatus for handling and stowing an anchor. 3,974,793, Cl. 114-210.000.

Armas, Joaquin P.: *See—*
Shaltz, Gregory P.; and Armas, Joaquin P., 3,975,273.

Armco Steel Corporation: *See—*
Pierson, Marvin B.; and Flinchum, Charles, 3,975,556.

Arnold, Fred E.: *See—*
Kovar, Robert F.; and Arnold, Fred E., 3,975,444.

Arnott, Robin A.: *See—*
Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,975,108.

Arroyo-Garcia, Carmen Santiago. System for fuel burning. 3,975,139, Cl. 431-208.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Yasuo, 3,975,091.
Takeda, Hideomi, 3,975,631.

Ashkin, Peter B.: *See—*
Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., 3,975,648.

Ashland Oil, Inc.: *See—*
Koch, S. Don, 3,975,295.

Asmus, Carl Junior; and Wickersham, Woodrow Christman, to Clayton Manufacturing Company. Rate control system for a brake testing apparatus. 3,974,687, Cl. 73-126.000.

Atlas Copco Aktiebolag: *See—*
Gidlund, Lennart Erik Idoft, 3,974,884.
Persson, Jan Edvard, 3,974,891.

Ato Chimie: *See—*
Poulain, Claude, 3,975,377.

Attaway, Julian J., to MM Systems Corporation. Expansion joint cover. 3,974,609, Cl. 52-273.000.

Aubert, Michel, to Societe Distrembal SA. Washing machine more especially for dental instruments and equipment for making dental prostheses. 3,974,843, Cl. 134-95.000.

Auto Egg (Bristol) Limited: *See—*
Bentley, John Richard; and Foley, Simon, 3,974,624.

Automatic Industrial Machines, Inc.: *See—*
Boettcher, Carl E., 3,975,226.

Automatisk Doseringskompensator AB: *See—*
Lindblom, K. Julius; and Kipping, Anders S. E., 3,974,779.

Automobiles Peugeot: *See—*
Castellani, Claude; and Roger, Yves, 3,974,677.
Giordano, Jean Louis; and Guettier, Michel, 3,975,062.

Avar, Lajos; and Hofer, Kurt, to Sandoz Ltd. Pyrazol(5)-/pyrazolone(5)metal complexes as stabilizers for organic materials. 3,975,382, Cl. 260-240.00G.

Avco Corporation: *See—*
Watkins, Sidney C., 3,974,966.

Avedissian, Serop. Annulus of joined settings with filiform claw elements. 3,974,662, Cl. 63-15.000.

Avildsen Tools and Machines, Inc.: *See—*
Kraiss, Gerald G., 3,975,110.

Avon Medicals Limited: *See—*
Steadman, Brian Lee, 3,974,938.

Ayusawa, Saburo: *See—*
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, 3,975,242.

B. F. Goodrich Company, The: *See—*
Dickens, Elmer D., Jr., 3,975,359.
Dickens, Elmer Douglas, Jr., 3,975,356.
Kramer, James H., 3,975,491.
Parks, Clarence E., 3,975,315.

Backhaus, Karl L.: *See—*
Fastert, Herbert; John, Wolfgang; and Backhaus, Karl L., 3,974,874.

Bader, Jorg, deceased (by Bader-Ludwig, Dagmar, legal representative), to Ciba-Geigy Corporation. Control of insects and acarids with N-phosphinylamidines. 3,975,522, Cl. 424-200.000.

Bader-Ludwig, Dagmar, legal representative: *See—*
Bader, Jorg, deceased, 3,975,522.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Himmele, Walter; Hofmann, Ernst; Hoffmann, Herwig; and Plass, Reinhold, 3,975,400.
Reicheneder, Franz; Kropp, Rudolf; Amann, August; Giertz, Hubert; and Schuster, Joerg, 3,975,526.

Baer, Hans; and Reichert, Kurt, to Knotex Maschinenbau GmbH. Thread clamp for warp end tying-in machines. 3,974,551, Cl. 28-49.000.

Bagcraft Corporation of America: *See—*
Ruda, Raymond J., 3,974,958.
Ruda, Raymond J., 3,974,959.

Bagshaw, Trevor; and McCann, John, to British Steel Corporation. Welding. 3,975,610, Cl. 219-76.000.

Baize, Sylvia S. Dewatering process. 3,975,266, Cl. 210-10.000.

Balaian, Ruben Dzhangirovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Balinski, Henry A., to United States Gypsum Company. Fire-rated common area separation wall structure having break-away clips. 3,974,607, Cl. 52-232.000.

Ballagh, Robert V. Orthopedic chair. 3,975,051, Cl. 297-434.000.

Balme, Maurice, to Rhone-Poulenc S.A. Process for the dehydration of bis-maleamic acids. 3,975,401, Cl. 260-326.260.

Balzers Patent und Beteiligungs AG: *See—*
Wulff, Gunther; and Vogt, Josef, 3,975,613.

Banks, Donald D. Heat shield composition. 3,975,142, Cl. 432-3.000.

Banks, Geoffrey Talbot: *See—*
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,975,520.

Barfoed, Sven: *See—*
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,975,318.
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,975,319.

Barker, Robert H.: *See—*
Jacks, Thomas J.; Barker, Robert H.; and Hensarling, Thomas P., 3,975,343.

Barlow, Gordon A., to Marvin Glass & Associates. Pinball type game apparatus. 3,975,019, Cl. 273-121.00A.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Lenk, Erich; and Illg, Peter, 3,974,973.

Barnewall, James M.; and Scheibelhoffer, Anthony S., to Goodyear Tire & Rubber Company, The. Industrial polyester yarn. 3,975,329, Cl. 260-75.00T.

Barouh, Victor; and Glenn, Robert. Cutter device for typewriter correction pick-off device. 3,974,539, Cl. 15-104.00R.

Barry, James D.; and Freedman, Paul M., to United States of America, Air Force. Dual function laser for space laser communications. 3,975,693, Cl. 331-94.50C.

Barteau, John F.; King, George J.; and Saenz, August M., to Church's Fried Chicken, Inc. Flour and batter apparatus. 3,975,070, Cl. 312-322.000.

Barth, Hans-Heinrich: *See*—
Wochnowski, Waldemar; Leckband, Uwe; Barth, Hans-Heinrich; and Hohm, Reinhard, 3,974,839.

Barthel, Dieter: *See*—
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

Bartik, Ivan. Method and apparatus for controlling the discharge of contaminants from ships. 3,974,940, Cl. 222-52.000.

Bartolucci, Edgar O. Visual indicator for identifying container contents. 3,974,916, Cl. 206-459.000.

Bartram, Nial C.: *See*—
Doyle, Edward J.; and Bartram, Nial C., 3,974,840.

BASF Aktiengesellschaft: *See*—
Burchard, Walther; and Eschwey, Helmut, 3,975,339.
Fischer, Adolf, deceased, 3,975,179.
Nintz, Eckhard; Schick, Rupert; Horacek, Heinrich; and Stahnecker, Erhard, 3,975,327.
Schmidt, Franz; Fahrbach, Gerhard; Schenk, Wolfgang; and Seiler, Erhard, 3,975,459.

Bate, Frederick Douglas Clavell. Method and apparatus for packaging. 3,974,623, Cl. 53-29.000.

Batley Controls Limited: *See*—
Stead, Michael; and Heap, Gordon, 3,974,860.

Bauer, James A.: *See*—
Elco, Richard A.; Bauer, James A.; and Treese, Willard E., 3,975,254.

Baumbach, Bertram W., to Reliable Electric Company. Line protector for communication circuit. 3,975,664, Cl. 317-66.000.

Baumgaertner, Eugene R., to Allied Chemical Corporation. Method for molding ultra-high molecular weight polyethylene molding powder. 3,975,481, Cl. 264-126.000.

Bayer Aktiengesellschaft: *See*—
Blahak, Johannes; Muller, Erwin; and Richert, Karl Hartwig, 3,975,428.
Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, 3,975,225.
Brack, Alfred, 3,975,150.
Claussen, Uwe; and Oppermann, Gunter, 3,975,291.
Eiter, Karl, 3,975,409.
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,975,534.
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,975,523.
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,975,375.
Reinehr, Ulrich; Nogaj, Alfred; and Schmidt, Wolfhard, 3,975,337.
Schmitt, Ernst, 3,975,379.
Schubart, Rudiger; and Eholzer, Ulrich, 3,975,333.

Baylor College of Medicine: *See*—
Normann, Nils A., 3,974,825.

Baysinger, Robert L.; and Newport, Harry E., Jr., to Emerson Electric Co. Burner control system. 3,975,136, Cl. 431-74.000.

BDH Pharmaceuticals Limited: *See*—
Hakim, Mehmood Abdulhameed; and Bysouth, Peter Thomas, 3,975,388.

Bean, Charles P.; and Giaever, Ivar, to General Electric Company. Method and apparatus for detecting molecules in solutions. 3,975,238, Cl. 195-103.50R.

Beatty, Gordon Wesley; and Young, Douglas Charles, to Elcon Manufacturing Company Limited. Wall structure and swimming pool construction. 3,974,605, Cl. 52-169.00R.

Beaver, Ruby C., to Inspection Technology Development, Inc. Pipeline leak detector. 3,974,680, Cl. 73-40.50R.

Beck, Kenneth H., to Tac Technical Instrument Corporation. Sequential event memory circuit for process and quality control. 3,975,261, Cl. 209-74.00M.

Beck, Nevitt S. Baseboard drainage system. 3,975,467, Cl. 261-30.000.

Beck, Roderick G.: *See*—
Shatila, Mounir A.; and Beck, Roderick G., 3,975,549.

Becker Flugfunkwerk: *See*—
Holl, Ludwig; Winkler, Adalbert; and Grunewald, Eberhard L., 3,975,665.

Beckley, Maxwell David. Structural component for forming load supporting frames. 3,974,616, Cl. 52-738.000.

Beckman Instruments, Inc.: *See*—
Oh, Chan S., 3,975,286.

Becton, Dickinson and Company: *See*—
Gizard, Pierre; and Boyer, Jean, 3,974,930.

Beecham Group Limited: *See*—
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 3,975,535.
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,975,520.
Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, 3,975,383.

Beemer, Robert J.: *See*—
Hill, Robert R.; and Beemer, Robert J., 3,975,145.

Beermann, Heinrich; Jacobs, Willi; and Lambrecht, Dietrich, to Kraftwerk Union Aktiengesellschaft. Coil end support for the stator winding of electric machines such as turbo generators or the like. 3,975,655, Cl. 310-260.000.

Behrens, Dieter; and Klotzsche, Heinz, to Siemens Aktiengesellschaft. In-circuit diode tester. 3,975,683, Cl. 324-158.00D.

Behrens, Rudolf Adolf, to American Cyanamid Company. Nonhydroscopic zinc halide compositions. 3,975,324, Cl. 260-23.0TN.

Bell Telephone Laboratories, Incorporated: *See*—
Fraser, David Bruce; and Lou, David Yuan Kong, 3,975,252.
Glass, Alastair Malcolm; and von der Linde, Dietrich, 3,975,632.
Gordon, Pat LeMar, 3,975,584.
Kubik, Peter Steve, 3,974,556.

Bemus, Richard D.: *See*—
Paulson, William T.; Davidson, David M., deceased; Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., 3,975,559.

Bengt Petersson New Products Investment AB: *See*—
Hagelberg, A. Torvald Sverker, 3,974,767.

Benjamin, George Washington. Drill bit centrifugal vise. 3,975,029, Cl. 279-1.00C.

Bennett, Donald R.; and McHard, James A., to Dow Corning Corporation. Prostate carcinoma treatment. 3,975,521, Cl. 424-184.000.

Bennett, Gene Lee, to Genio Tools, Inc. Tool mounting device. 3,975,031, Cl. 279-14.000.

Bent, John H.; and Russo, Anthony, to Minnesota Mining and Manufacturing Company. Surgical wire driving assembly. 3,975,032, Cl. 279-30.000.

Bentley, Clarence. Drip irrigation valve with spring biased plunger. 3,974,853, Cl. 137-503.000.

Bentley, John Richard; and Foley, Simon, to Auto Egg (Bristol) Limited. Apparatus for distributing articles into receptacles. 3,974,624, Cl. 53-160.000.

Benzon-Petersen, Boye Ditlef, to AB Akerlund & Rausing. Packages. 3,974,957, Cl. 229-55.000.

Beppu, Norio, to Minolta Camera Kabushiki Kaisha. Automatic exposure control circuit for a single lens reflex camera of TTL light measuring type. 3,975,746, Cl. 354-51.000.

Berezovsky, Victor Leontjevich: *See*—
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Berg, Betsy Helen; and Szabo, Susana S., to BSG Designs Inc. Cloth reserve dyeing. 3,975,151, Cl. 8-14.000.

Bergey, John M.; McCullough, Robert E.; and O'Connor, Arthur H., to Time Computer, Inc. Light emitting diode wristwatch with angular display. 3,974,637, Cl. 58-50.00R.

Bergmann, Werner J.; and Worden, John A., to Aluminum Company of America. Method and apparatus for welding members together. 3,974,955, Cl. 228-256.000.

Bergounhon, Rene, to Societe Rhone-Progil S.A. Expansible mold for the manufacture of plaster pieces. 3,975,131, Cl. 425-405.00H.

Bergquist, Everett John; and Jennings, Lawrence Joseph, to United Technologies Corporation. Electrolyte for electrochemical machining of nickel base superalloys. 3,975,245, Cl. 204-129.950.

Bergstedt, Donald C.: *See*—
Feild, Eugene P.; and Bergstedt, Donald C., 3,975,116.

Bergwerksverband GmbH: *See*—
Henkel, Egon; and Wildforster, Heinrich, 3,974,716.

Berner, Albert. Anchoring device for screws. 3,974,735, Cl. 85-72.000.

Bertolet, Carol F. Combined staple removing and retrieving device. 3,974,999, Cl. 254-28.000.

Bertrand, Raymond; Tenaud, Jean; and Grabowski, Rene, to Deere & Company. Forage harvester cutterhead. 3,974,970, Cl. 241-222.000.

Berube, James E.; and Neumeier, Gunter F., to Stromberg-Carlson Corporation. Service code conversion. 3,975,595, Cl. 179-18.0BA.

Besseyre, Jacques A.; Jacquart, Christian A.; and Marijon, Jean-Louis H., to International Business Machines Corporation. Acoustic feedback control. 3,975,588, Cl. 179-1.0FS.

Betensky, Ellis I., to Ponder & Best, Inc. Zoom lens. 3,975,089, Cl. 350-184.000.

Bethke, Erwin, to F. L. Smithe Machine Company, Inc. Apparatus for collating sheet like elements. 3,974,748, Cl. 93-61.00A.

Betts Machine Company: *See*—
Pierson, Karl B., 3,974,850.

Beun, Matthijs; and Reijnierse, Pieter, to U.S. Philips Corporation. Method of and device for skeletonizing characters. 3,975,709, Cl. 340-146.30H.

Bharat, Ramasesha. Charge coupled device including a slow-wave structure for providing charge transfer. 3,975,753, Cl. 357-24.000.

Bianchi, Nereo, to Necchi S.p.A. Automatic sewing unit. 3,974,786, Cl. 112-121.120.

Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, to Allmanna Svenska Elektriska Aktiebolaget. Magnetoelastic shear force measuring means for measuring shear stress in tubular axles. 3,975,685, Cl. 324-34.0ST.

Billottet, Henri; and Fechner, Patrice, to Thomson-CSF. System for aiming projectiles at close range. 3,974,740, Cl. 89-41.05W.

Biological Developments, Inc.: *See—*
Gross, Stanley Joseph, 3,975,342.

Bird, Forrest M. Ventilator and method. 3,974,828, Cl. 128-145.800.

Bitsch, Robert: *See—*
Cerles, Georges; and Bitsch, Robert, 3,974,572.

Black Clawson Company, The: *See—*
Erdody, Robert G.; Harmon, Paul E.; and Tetro, Richard S., 3,974,723.

Black, Millard G.; Sheldon, Warren D.; and Cook, Dennis S., to Walt Disney Productions. Speed control system. 3,974,778, Cl. 104-148.0LM.

Black, William J.; and Lanz, William E., to Caterpillar Tractor Co. Bucket tooth adapter support and load transfer means. 3,974,579, Cl. 37-141.00T.

Blackstone, Michael M.: *See—*
Tate, Stanley L.; Rowland, Bobby A.; and Blackstone, Michael M., 3,975,208.

Blahak, Johannes; Muller, Erwin; and Richert, Karl Hartwig, to Bayer Aktiengesellschaft. Aromatic amines formed by the reaction of isatoic acid anhydride with compounds containing at least one tertiary nitrogen atom and at least two hydroxyl groups. 3,975,428, Cl. 260-472.000.

Blair, Edgar Allan: *See—*
Hudgin, Donald Edward; and Blair, Edgar Allan, 3,975,350.

Blake, Jack L., Jr. Directional drilling tool. 3,974,886, Cl. 175-76.000.

Blakesley, Roland Francis; and Dunn, Daniel Lincoln, to International Telephone and Telegraph Corporation. Pin and socket terminal connector using clad material. 3,975,079, Cl. 339-278.00C.

Blanchard, Eugene J.: *See—*
Harper, Robert J., Jr.; Bruno, Joseph S.; Blanchard, Eugene J.; and Gautreaux, Gloria A., 3,975,152.

Blau KG Fabrik fur Kraftfahrzeugteile: *See—*
Gerdes, Theodor, 3,974,936.

Bliamptis, Emmanuel E., to United States of America, Air Force. Plural electrode system for determining the electrical parameters of large samples of materials in situ. 3,975,676, Cl. 324-9.000.

Block Engineering, Inc.: *See—*
Block, Myron J., 3,975,084.

Block, Myron J., to Block Engineering, Inc. Particle detecting system. 3,975,084, Cl. 356-103.000.

Blom, Gerald E.; and VanLeuven, Robert W. Fishing lure with self-setting capability. 3,974,588, Cl. 43-15.000.

Blomgren, David Carl; and Sanchez, Robert D., to Sanchez, Lois Loreen; Sanchez, Robert Daniel; and Blomgren, David Carl, part interest to each. Automobile roof vent. 3,974,753, Cl. 98-2.140.

Blonde, Guy. Means for forming a building facade. 3,974,995, Cl. 249-19.000.

Bluekens, Antonius Matheus Johanna: *See—*
Van Esdonk, Johannes; Hornman, Johannes Petrus; Bluekens, Antonius Matheus Johanna; and Mattheij, Mathieu Martinus Maria Petrus, 3,974,583.

Bodeen, Joseph J., to Angileri, Benjamin T. Portable orthopedic device. 3,974,827, Cl. 128-70.000.

Bodem, Johann: *See—*
Strohmeier, Gerolf; and Bodem, Johann, 3,974,555.

Bodor, Steven. Inflatable ball. 3,975,016, Cl. 273-58.00R.

Boeck, Alexander: *See—*
Hachmann, Klaus; Jakobi, Gunther; Weber, Rudolf; Boeck, Alexander; and Jung, Dieter, 3,975,280.

Boeddeker, David R.: *See—*
Wenger, Jerry A.; Urch, Harvey M.; and Boeddeker, David R., 3,974,894.

Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, 3,975,539.
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; and Danneberg, Peter, 3,975,525.
Narr, Berthold; Roch, Josef; Muller, Erich; and Haarmann, Walter, 3,975,384.
Nickl, Josef; Muller, Erich; Schroter, Wolfgang; Haarmann, Walter; and Roch, Josef, 3,975,524.
Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, 3,975,368.

Boehringer Mannheim G.m.b.H.: *See—*
Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,975,398.

Boeing Company, The: *See—*
Aring, John Alan, 3,974,793.
Whitworth, Samuel, 3,974,988.

Boettcher, Carl E., to Automatic Industrial Machines, Inc. Apparatus for dry printing on contoured workpieces. 3,975,226, Cl. 156-358.000.

Boggs, William O. Apparatus for composing composite illustrations. 3,975,094, Cl. 353-35.000.

Bogner, Richard D. Transmitting antenna employing radial fins. 3,975,733, Cl. 343-770.000.

Bohl, Thomas L.; Goodnight, Lyman E., Jr.; Ruble, Herschel C.; and Wells, John H., to Milton Roy Company. Colorimetric analyzer. 3,975,160, Cl. 23-253.00R.

Bokalders, Janis A.; and Jurich, Rade, to Wehr Corporation. Press unloader. 3,974,919, Cl. 214-1.0BT.

Bole, Claude E., to United States Steel Corporation. Method for recovering phase components from a mixture of solids and liquids. 3,975,272, Cl. 210-68.000.

Bolger, Joseph E. Motorcycle rear wheel suspension. 3,974,892, Cl. 180-32.000.

Bolkow Gesellschaft mit beschrankter Haftung: *See—*
Thomanek, Franz Rudolf, 3,974,771.

Bollen, Philip Stuart; and Amin, Surendra A., to Allied Chemical Corporation. Films and sheets of polyester-polycarbonate blends. 3,975,355, Cl. 260-40.00R.

Bollen, Phillip Stuart; Amin, Surendra A.; and Sacks, William, to Allied Chemical Corporation. Production of films and sheets of polyester-polycarbonate blends. 3,975,485, Cl. 264-171.000.

Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, to Minerec Corporation. Flotation of copper sulfide ores with improved thionocarbamates. 3,975,264, Cl. 209-166.000.

Bolton, Albert Edward, to Aeroplane & Motor Aluminium Castings Limited. Casting apparatus with three-part core. 3,974,997, Cl. 249-142.000.

Bolton, John R.: *See—*
Knudson, Richard C.; and Bolton, John R., 3,975,561.

Bondarev, Konstantin Timofeevich: *See—*
Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and Ruga, Viktor Astievich, administrator, 3,975,130.

Bondurant, David L.: *See—*
Palmer, Billy W.; Bondurant, David L.; and Hagemeyer, Hugh J., Jr., 3,975,450.

Bonner, William J. Ribbon cleaning and scanning apparatus. 3,974,540, Cl. 15-306.00A.

Boone, George R. Submersion device which changes configuration in response to temperature. 3,974,590, Cl. 43-43.140.

Boots, Vernie A., to A. Duda and Sons. High volume cutter for elongate food products. 3,974,725, Cl. 83-100.000.

Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., to SCM Corporation. Insect repellent compositions having an N-substituted hydroxyalkyl amine as an active ingredient. 3,975,541, Cl. 424-325.000.

Borg-Warner Corporation: *See—*
Anderson, Roy S.; and Pendleton, John F., 3,975,332.
Ivey, John S., 3,974,743.

Bornhorst, Walter J.: *See—*
Oettinger, Peter E.; and Bornhorst, Walter J., 3,974,578.

Borror, Alan L.; and Greenwald, Richard B., to Polaroid Corporation. Alkylthioalkyl-substituted alkylsulfonylacetonitriles. 3,975,423, Cl. 260-465.100.

Bory, Michael; and Grendelmeier, Georg, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for a machine tool for the automatic generating of a switching signal and for reducing the speed of a tool. 3,975,667, Cl. 318-39.000.

Boshnyaga, Valery Anatolievich; Kalinin, Lev Pavlovich; and Postolaty, Vitaly Mikhailovich. Phase shifter. 3,975,673, Cl. 323-119.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Boron-containing, quaternary ammonium salt-containing resin compositions. 3,975,346, Cl. 260-29.2EP.

Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Thin, non-porous polycarbonate films. 3,975,225, Cl. 156-242.000.

Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, to Rhone-Poulenc S.A. 7-Trichloroacetamido-3-desacetoxy-cephalosporanic acid esters. 3,975,385, Cl. 260-243.00C.

Bourlet, Maurice V., to Fabrique Nationale Herstal S.A. Belt ammunition box for portable weapons. 3,974,739, Cl. 89-34.000.

Bourlier, Jean Noel: *See—*
Boux, Rene; and Bourlier, Jean Noel, 3,975,640.

Boux, Rene; and Bourlier, Jean Noel, to C.G.R.-Mev. Process for centering an ionizing radiation sweep beam and device for carrying out this process. 3,975,640, Cl. 250-385.000.

Bower, Allen M.: *See—*
Fenton, David T.; and Bower, Allen M., 3,974,865.

Bowerman, Paul David, to Kerr-McGee Chemical Corporation. Metals recovery from hydrochloric acid solutions. 3,975,495, Cl. 423-55.000.

Bowling, Roy E.; Buchtel, Arnold J.; and Keller, Dwight E., to Overhead Door Alert Company, Inc. Door alert system and magnetic switch therefor. 3,975,723, Cl. 340-274.00R.

Boyer, Jean: *See—*
Gizard, Pierre; and Boyer, Jean, 3,974,930.

Boyer, Ronald J.; Stenseth, Raymond E.; and Sheehan, Richard J., to Monsanto Company. Color stabilization of refined dicarboxylic acid anhydrides. 3,975,408, Cl. 260-346.80R.

Boyle, Robert John; Rucker, Howard Lewis; Mastro, Alex Anthony; and Jackson, Thomas Peter, to Johns-Manville Corporation. Sealing cartridge for rotating shafts. 3,975,026, Cl. 277-4.000.

BP Chemicals International Limited: *See—*
Dobson, Kenneth Rowland, 3,975,364.

Brachlianoff, Arcady. Method and apparatus for the rotation of a spherical object around a virtual axis passing through its center. 3,974,577, Cl. 35-46.00R.

Brack, Alfred, to Bayer Aktiengesellschaft. Transfer printing process. 3,975,150, Cl. 8-2.50R.

Bradshaw, George W., to Lilicy, Peter; and Lilicy, Peter G., part interest to each. Carburetor auxiliary fluid injector. 3,975,466, Cl. 261-18.00A.

Bradshaw, Janice: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,975,376.

Braithwaite, David G.; and Hettinger, William P., Jr., to NL Industries, Inc. High bulk density magnesium chloride and method for making same. 3,975,283, Cl. 252-182.000.

Brammall, Inc.: *See—*
Van Gompel, James J., 3,975,040.

Breed, Michal A.; and Marsch, James E., to Allis-Chalmers Corporation. Four pinion differential. 3,974,717, Cl. 74-713.000.

Breitenfellner, Franz: *See—*
Buxbaum, Lothar; and Breitenfellner, Franz, 3,975,354.

Brenan, Robert R.; and Johnson, Gordon L., to GTE Sylvania Incorporated. Apparatus for making tined electrical contacts. 3,974,954, Cl. 228-13.000.

Bretschneider, Rudolf: *See—*
Zdarsky, Josef; Rehor, Jan; and Bretschneider, Rudolf, 3,975,204.

Brettschneider, Johannes: *See—*
Knapp, Heinrich; Brettschneider, Johannes; and Bundesen, Lorenz, 3,974,813.

Brewer, Gordon A.: *See—*
Shaw, Howard A.; and Todhunter, John D., 3,974,907.

Briggs, Aubrey C., to Dravo Corporation. Reeving system for a scissor-type clamshell bucket. 3,975,044, Cl. 294-70.000.

British Aircraft Corporation: *See—*
Dobson, Geoffrey Townsend; and Chamberlain, Sidney George, 3,974,984.

British Petroleum Company Limited, The: *See—*
Crathorne, Elizabeth Anne; Howell, Ian Valentine; and Pitkethly, Robert Chalmers, 3,975,299.
Eyles, Martin Keith; and Pout, Christopher Ronald, 3,975,303.

British Secretary of State for Defence: *See—*
Paige, Edward George Sydney, 3,975,697.

British Steel Corporation: *See—*
Bagshaw, Trevor; and McCann, John, 3,975,610.

Broadview Chemical Corporation: *See—*
Manaka, Kazuo, 3,975,340.

Brock, Bill M., Jr.; Marquette, Leo Jude; and Nelson, Norman Allen, to Stewart & Stevenson Oiltools, Inc. Method of and apparatus for measuring annulus pressure in a well. 3,974,690, Cl. 73-151.000.

Brockett, Frank Howard, III; Philp, James E.; and Sullivan, Arthur Francis, to International Nickel Company, Inc., The. Undersea mining and separating vehicle having motor-powered water jet. 3,975,054, Cl. 299-8.000.

Broddevall, Bengt Gunnar, to Uddeholms Aktiebolag. Method of largely eliminating volume change in a resin bed due to changes in the pH of liquid equipment by use of resin mixtures with compensating properties. 3,975,268, Cl. 210-36.000.

Brodersen, Rolf K., to United States of America, Navy. Fluidic inertial gyro. 3,974,702, Cl. 74-5.60B.

Brookside Metal Company Limited: *See—*
Hunter, William, 3,975,244.

Brown, Frank H. Machine for folding flexible sheets. 3,975,009, Cl. 270-68.00A.

Brown, Henry Bispham; and DeTolla, Francis Louis, to United Technologies Corporation. Apparatus for sealing a gas turbine flow path. 3,975,112, Cl. 415-116.000.

Brown, Jesse C. Oscillating piston internal combustion engine. 3,974,801, Cl. 123-18.00R.

Brown, Louis R.; and Saunders, Michael A., to Burroughs Corporation. Tape feed and rewind cartridge. 3,974,983, Cl. 242-194.000.

Brown, Melbourne Thomas. Educational device employing a game situation. 3,975,021, Cl. 273-135.00B.

Brown, Webster W., Jr., to Phillips Petroleum Company. Apparatus for purifying HF catalyst in an alkylation process. 3,975,164, Cl. 23-288.00H.

Brown & Williamson Tobacco Corporation: *See—*
Mitchell, Terence G.; and Pritchard, John A., 3,974,838.

Browne, Frank L.: *See—*
Toth, Maria; and Browne, Frank L., 3,974,933.

Brunet, Jean-Paul; and Cometti, Andre, to Rhone-Poulenc S.A. Dibenzo (a,d) cycloheptene derivatives. 3,975,437, Cl. 260-558.00P.

Bruno, Joseph S.: *See—*
Harper, Robert J., Jr.; Bruno, Joseph S.; Blanchard, Eugene J.; and Gautreaux, Gloria A., 3,975,152.
Harper, Robert J., Jr.; Gautreaux, Gloria A.; and Bruno, Joseph S., 3,975,154.

BSG Designs Inc.: *See—*
Berg, Betsy Helen; and Szabo, Susana S., 3,975,151.

Buchtel, Arnold J.: *See—*
Bowling, Roy E.; Buchtel, Arnold J.; and Keller, Dwight E., 3,975,723.

Buck, Carl J., to Johnson & Johnson. Preparation of bis (2-cyanoacrylate)monomers. 3,975,422, Cl. 260-465.400.

Buck, Kenneth William: *See—*
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,975,520.

Buckiso, Michael A.: *See—*
Abarotin, Eugene V.; and Buckiso, Michael A., 3,975,045.

Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, to Beecham Group Limited. Anti-allergic-3-carboxy-isocoumarin compositions and methods of use. 3,975,535, Cl. 424-279.000.

Budd Company, The: *See—*
Estrada, Henry F., 3,974,780.

Budny, Thomas F., to Dow Chemical Company, The. Dispensing carton for roll materials. 3,974,947, Cl. 225-25.000.

Budrose, Charles R. Combination card and tape recorder. 3,975,767, Cl. 360-88.000.

Buell, Eugene F.: *See—*
Shaw, Howard A.; and Todhunter, John D., 3,974,907.

Buford, Wesley E. Torch type pipe cutter. 3,975,003, Cl. 266-56.000.

Buhrer, Erwin. Method and apparatus for production of casting molds. 3,974,872, Cl. 164-40.000.

Buisson, Marcel. Packaging using a sheath folded onto a mandrel. 3,974,912, Cl. 206-303.000.

Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. Processes of producing 2,5-disubstituted benzamides. 3,975,434, Cl. 260-556.00B.

Bumann, Richard Leigh, to Burroughs Corporation. Machine loader and unloader. 3,974,920, Cl. 214-1.00F.

Bundesen, Lorenz: *See—*
Knapp, Heinrich; Brettschneider, Johannes; and Bundesen, Lorenz, 3,974,813.

Burchard, Walther; and Eschwey, Helmut, to BASF Aktiengesellschaft. Manufacture of polymers of net-shaped structure. 3,975,339, Cl. 526-347.000.

Burger, Norman D.: *See—*
Burger, Norman Donald, 3,974,945.

Burger, Norman Donald, to Burger, Norman D.; and Mardesich, Nicholas, part interest to each. Aerosol dispensing system. 3,974,945, Cl. 222-192.000.

Burgess, Glenn A.; and Taylor, Paul J., to Garrett Corporation, The. Pressure control system. 3,974,752, Cl. 98-1.500.

Burlington Industries, Inc.: *See—*
Yelton, Emerson McBrayer; and Reid, James Paul, Jr., 3,974,534.

Burman, Darrell C.: *See—*
Franer, Victor R.; and Burman, Darrell C., 3,975,563.

Burnell, Anthony John; and Grant, Robert, to Earl & Wright. Semi-submersible, directionally controlled drilling unit. 3,974,792, Cl. 114-144.00B.

Burnham, Gerald E., Jr.: *See—*
Burnham, Gerald E., Sr.; and Burnham, Gerald E., Jr., 3,975,171.

Burnham, Gerald E., Sr.; and Burnham, Gerald E., Jr. Apparatus and method for degassing drilling fluids. 3,975,171, Cl. 55-36.000.

Burress, George T., to Mobil Oil Corporation. One step method of preparation of vanadium-phosphorus complex in the absence of hydrogen halide. 3,975,300, Cl. 252-435.000.

Burroughs Corporation: *See—*
Brown, Louis R.; and Saunders, Michael A., 3,974,983.
Bumann, Richard Leigh, 3,974,920.
Ogle, James A., 3,975,725.
Panigrahi, Godavarish, 3,975,717.

Bushnell, James D.; and Ryan, Douglas G., to Exxon Research and Engineering Company. Deasphalting process. 3,975,396, Cl. 208-309.000.

Butas, Joseph T., Jr. Log splitter. 3,974,867, Cl. 144-193.00A.

Butcher, Alan De Vere: *See—*
Elbert, Raymond John; and Butcher, Alan De Vere, 3,975,165.

Buxbaum, Lothar; and Breitenfellner, Franz, to Ciba-Geigy Corporation. Glass fiber-reinforced flame-resistant thermoplastic polyester moulding compositions containing poly(2,4,6-tribromostyrene). 3,975,354, Cl. 260-40.00R.

Bysouth, Peter Thomas: *See—*
Hakim, Mehmood Abdulhameed; and Bysouth, Peter Thomas, 3,975,388.

C.G.R.-Mev.: *See—*
Boux, Rene; and Bourlier, Jean Noel, 3,975,640.

Camboulives, Andre Alphonse Mederic Leon; le Maout, Theophile Francois; Rejzner, Jacques Serge; and Vandenbroucke, Roger Alfred Jules, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Thermal responsive noise suppressor for exhaust duct. 3,974,649, Cl. 60-271.000.

Camerlinck, Pierre, to Saint-Gobain Industries. Manufacture of foam glass. 3,975,174, Cl. 65-22.000.

Campbell Chain Company: *See—*
Roberts, Alfred M., 3,974,544.

Campbell, John M.; and Oestreich, James W., to United States of America, Navy. Wide angle seeker. 3,974,985, Cl. 244-3.160.

Campos, Senobio. Mono-seal pump piston. 3,974,746, Cl. 92-244.000.

Canadian Patents and Development Limited: *See—*
Farnand, Joseph Redmond; and Puddington, Ira Edwin, 3,975,194.
Nasser, Karim W., 3,974,679.
Wilson, Michael R., 3,975,517.

Canon Kabushiki Kaisha: *See—*
Ito, Matsutoshi; Nishikawa, Tatsuo; and Takeshita, Kano, 3,975,707.
Minoura, Kazuo; and Hirabayashi, Yoichi, 3,975,095.

Cantaluppi, Angelo: *See—*
della Porta, Paolo; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,975,304.

Cantello, Barrie Christian Charles: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles, and Smith, Harry, 3,975,535.

Carborundum Company, The: *See—*
Cottis, Steve G.; Economy, James; and Wohrer, Luis C., 3,975,487.
Myles, Thomas A.; and Zimmer, Curtis E., 3,975,308.

Carlson, Aileen S. Girdle. 3,974,836, Cl. 128-526.000.

Carpenter, Horace G., to Texas Instruments Incorporated. Circuit breaker. 3,975,702, Cl. 337-62.000.

Carrier Communications, Inc.: *See—*
Halstead, William S., 3,975,700.

Carter, James Coolidge. Pump and motor unit with inducer at one end and centrifugal impeller at opposite end of the motor. 3,975,117, Cl. 417-370.000.

Carter, Roy M.; and Carter, Troy M. Rolling device. 3,974,751, Cl. 93-84.00R.

Carter, Troy M.: *See—*
Carter, Roy M.; and Carter, Troy M., 3,974,751.

Cartwright, William J.: *See—*
Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., 3,974,922.

Carvey, Philip P., to Applicon Incorporated. Electrographic system. 3,975,592, Cl. 178-18.000.

Cash, Donald Edwin, to Du Pont de Nemours, E. I., and Company. Process for producing high active oxygen, low bulk density sodium perborate. 3,975,500, Cl. 423-281.000.

Castellani, Claude; and Roger, Yves, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Forging of metal components. 3,974,677, Cl. 72-340.000.

Caterpillar Tractor Co.: *See—*
Black, William J.; and Lanz, William E., 3,974,579.
Effefield, Larry G., 3,974,882.
Habiger, Cyril W., 3,974,715.
Johnson, Howard L., 3,974,742.

Ceballos-Aquilera, Ing. Guillermo. Process for the manufacture of sorghum flour. 3,974,968, Cl. 241-11.000.

Celamerck GmbH & Co. KG: *See—*
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, 3,975,527.

Celanese Corporation: *See—*
Rulison, Richard N., 3,975,482.
Trapasso, Louis E., 3,975,341.

Celechovska, Olga: *See—*
Svoboda, Vlastimil; and Celechovska, Olga, 3,975,161.

Central Glass Co., Ltd.: *See—*
Masuda, Hiroshi, 3,975,177.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Ramacciotti, Aldo; Repetto, Eugenio; and Sommovigo, Paolo, 3,975,577.
Repetto, Eugenio, 3,974,691.

Cerles, Georges; and Bitsch, Robert, to Aluminium Pechiney. Process and heat exchanger for continuous circulation of fluidized powder in heat exchange with a hot gas. 3,974,572, Cl. 34-10.000.

Cervinka, Jaroslav; Hofman, Oldrich; and Husak, Pavel, to JAWA, narodni podnik. Fluid operator for releasing and rapidly engaging a clutch. 3,974,901, Cl. 192-83.000.

Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, to Beecham Group Limited. Biologically active material. 3,975,520, Cl. 424-181.000.

Chakhlov, Vladimir Lukyanovich: *See—*
Geizer, Alfred Albertovich; and Chakhlov, Vladimir Lukyanovich, 3,975,689.

Chamberlain, Sidney George: *See—*
Dobson, Geoffrey Townsend; and Chamberlain, Sidney George, 3,974,984.

Chang, Wen-Hsuan; and Porter, Samuel, Jr., to PPG Industries, Inc. Thermoplastic extensible coating compositions. 3,975,457, Cl. 260-859.00R.

Chapman, Everett E.: *See—*
Levitt, Barry N.; Crocker, Thomas H.; and Chapman, Everett E., 3,975,625.

Chapman, Lloyd R.: *See—*
Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., 3,975,636.
Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., 3,975,705.

Cheever, Donald C.: *See—*
Davis, Sheridan; and Cheever, Donald C., 3,975,579.

Chemidyne Corporation: *See—*
Miller, Galen R., 3,974,965.

Chemprobe Corporation: *See—*
Gorman, Lee V., 3,975,248.

Chen, David Y.; and Fitzmayer, Louis H., to General Electric Company. Food thermometer for microwave oven. 3,975,720, Cl. 340-228.00R.

Cheng, Paul J., to Phillips Petroleum Company. Production of carbon black from coal. 3,975,504, Cl. 423-449.000.

Chevron Research Company: *See—*
Nierman, Albert J., 3,975,167.
Stayner, Robert A., 3,975,216.
Suzuki, Shigeto, 3,975,449.

Chodorow, Ingran S., to Placontrol Inc. Disposable flosser. 3,974,842, Cl. 132-91.000.

Chorkey, William J., to Ace Controls, Inc. Resilient mounting structure. 3,975,007, Cl. 267-152.000.

Chow, Sen-Te; and Pupich, John J., to United States of America, Army. Automatic low frequency gain limited circuit for eliminating signal suppression in an A-C coupled video processing system. 3,975,586, Cl. 178-7.50R.

Christena, Ray C., to Vulcan Materials Company. Water-extended polyesteramide resins and methods for their production. 3,975,348, Cl. 260-29.6NR.

Chrysler Corporation: *See—*
Claunch, Robert W.; Deane, Thomas N.; Rogan, Patrick D. M.; Powe, Carl M.; and Werner, Mark, 3,974,528.
Martin, Frank J.; and Holbrook, Rex R., 3,975,609.

Church's Fried Chicken, Inc.: *See—*
Barteau, John F.; King, George J.; and Saenz, August M., 3,975,070.

Ciba-Geigy AG: *See—*
Duerr, Dieter, 3,975,418.

Ciba-Geigy Corporation: *See—*
Bader, Jorg, deceased, 3,975,522.
Buxbaum, Lothar; and Breitenfellner, Franz, 3,975,354.
Habermeier, Juergen; and Porret, Daniel, 3,975,397.
Wick, Arnold; and Jost, Max, 3,975,410.

Clark, Homer E., Jr., to S & W Ammunition Company. Shot container for shotgun cartridges. 3,974,770, Cl. 102-42.00C.

Claunch, Robert W.; Deane, Thomas N.; Rogan, Patrick D. M.; Powe, Carl M.; and Werner, Mark, to Chrysler Corporation. Sewage system with reusable flush medium. 3,974,528, Cl. 4-10.000.

Claussen, Uwe; and Oppermann, Gunter, to Bayer Aktiengesellschaft. Process for producing laser light. 3,975,291, Cl. 252-301.170.

Clayton Manufacturing Company: *See—*
Asmus, Carl Junior; and Wickersham, Woodrow Christman, 3,974,687.
Cline, Edwin Lee, 3,974,688.

Clegg, Giles C., Jr.: *See—*
Tate, George W., Jr., 3,974,829.

Clevenger, Earl C., to Platt Saco Lowell Corporation. Noise isolation mounting means for tape tensioner assembly of a textile yarn twister. 3,974,633, Cl. 57-1.00R.

Cline, Edwin Lee, to Clayton Manufacturing Company. Computer type brake analyzer. 3,974,688, Cl. 73-126.000.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 3,975,213.

Cline, Robert C., to F. L. Russell Corporation. Sheet lifter with punches for looseleaf book. 3,975,105, Cl. 402-1.000.

Coats & Clark, Inc.: *See—*
Einhorn, Rudiger, 3,974,557.

Cohen, Marvin M.: *See—*
Lanigan, Daniel J.; and Cohen, Marvin M., 3,975,756.

Colaiaco, August P.: *See—*
Albert, Willard S.; and Colaiaco, August P., 3,975,603.

Coleman, Dean O.: *See—*
Ziegenhain, William C.; Leach, Bruce E.; and Coleman, Dean O., 3,975,231.

Colle, Pierre: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Colquett, Jack L.: *See—*
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,974,763.

Colt Industries Operating Corporation: *See—*
Henderson, Robert M.; Zechlin, Richard; and Reddy, K. Narasimha, 3,974,816.
Henderson, Robert M.; and Zechlin, Richard, 3,974,817.

Columbia Gas Service Corporation: *See—*
Eberle, Arthur C.; Venendaal, Robert G.; and Munk, William D., 3,974,694.

Columbia Pictures Industries, Inc.: *See—*
Kirk, Donald, Jr.; and Paolini, Michael J., 3,975,585.

Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D., 3,974,640.

Combustion Engineering, Inc.: *See—*
Keating, Stephen Joseph, Jr., 3,975,170.

Cometti, Andre: *See—*
Brunet, Jean-Paul; and Cometti, Andre, 3,975,437.

Commissariat a l'Energie Atomique: *See—*
Allemand, Robert, 3,975,639.
Grunberg, Claude; and Le Devehat, Jean, 3,975,638.
Roule, Maurice; and Saglio, Robert, 3,974,684.

Communicatons Satellite Corporation (Comsat): *See—*
Fleming, Paul L., 3,975,690.

Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.E.C.A.): *See—*
Dunand, Jean-Jacques; and Delayre, Jean, 3,975,675.

Compagnie Des Terminaux Marins Coterm: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Jossic, Alain Francois, 3,974,765.

Compagnie Industrielle de Filtration et d'Equipement Chimique: *See—*
Lambert, Marc, 3,975,284.

Compagnie Internationale pour l'Infomatique: *See—*
Dejouhanet, Jean-Pierre; and Lazzari, Jean-Pierre, 3,975,773.

Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean-Pierre, 3,975,771.
Stiegler, Jacques Paul, 3,974,981.

Concast Incorporated: *See—*
Fastert, Herbert; John, Wolfgang; and Backhaus, Karl L., 3,974,874.

Conch Lng (General Partnership): *See—*
Ffooks, Roger Cambridge, 3,974,935.

Conchemco, Incorporated: *See—*
Rooney, Robert L.; and Sautter, James W., 3,974,678.

Condon, Robert: *See—*
Green, Dale; Erway, Duane; Condon, Robert; Schoonover, William C.; and Rowe, Norman L., 3,975,748.

Conn, John L.; and Spector, George. Easy anchor. 3,974,604, Cl. 52-160.000.

Connelly, Larry J.: *See—*
Gross, Anthony E.; and Connelly, Larry J., 3,975,183.

Conner, Charles C.; and Price, William R., to Price, William R. Method and apparatus for sensing and controlling motion of a movable member. 3,974,893, Cl. 180-105.00E.

Continental Can Company, Inc.: *See—*
Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., 3,974,922.

Continental Oil Company: *See—*
Leach, Bruce E.; Hritz, George G.; and Royer, Dennis Jack, 3,975,510.
Radd, Frederick J.; Wolfe, Louis H.; and Oertle, Donald H., 3,975,253.
Royer, Dennis Jack; and Hritz, George G., 3,975,509.
Yang, Kang; and Reedy, James D., 3,975,230.
Ziegenhain, William C.; Leach, Bruce E.; and Coleman, Dean O., 3,975,231.

Cook, Dennis S.: *See—*
Black, Millard G.; Sheldon, Warren D.; and Cook, Dennis S., 3,974,778.

Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. Pencillins having a 6β-(α-etherified oximino) acylamido group. 3,975,376, Cl. 260-239.100.

Cooper Tire and Rubber Company: *See—*
Klose, Karl W., 3,974,953.

Copeland, Robert W. Method of determining operating condition of city street lighting units. 3,975,101, Cl. 356-162.000.

Coquery, Jean-Paul; Labedan, Pierre; and Roland, Raymond, to S.T.X., Groupement d'Interet Economique. Apparatus for batch treatment of textile materials. 3,974,666, Cl. 68-8.000.

Cornell University: *See—*
Kosikowski, Frank V., 3,975,544.

Corning Glass Works: *See—*
Vann, William P.; and Yaverbaum, Sidney, 3,975,511.

Cortina, Pablo Ortega. Method of and means for multi-story building construction. 3,974,618, Cl. 52-745.000.

Cottis, Steve G.; Economy, James; and Wohrer, Luis C., to Carborundum Company, The. Process for spinning high modulus oxybenzoyl copolyester fibers. 3,975,487, Cl. 264-210.00F.

Cotton Incorporated: *See—*
Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., 3,974,964.

Coulson, Dale Robert; and Seiwell, Linda P., to Du Pont de Nemours, E. I., and Company. Organotin complexes of platinum and palladium. 3,975,415, Cl. 260-429.00R.

Coulter Diagnostics, Inc.: *See—*
Hamill, Thomas E., 3,975,405.

Cournoyer, Georges A. Fifth chords indicating and music teaching device. 3,974,733, Cl. 84-473.000.

Courty, Philippe; Sugier, Andre; and Le Page, Jean-Francois, to Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf. Supported catalyst for oxidizing methanol to formaldehyde and its manufacturing process. 3,975,302, Cl. 252-455.00R.

Coussediere, Daniel: *See—*
Pierdet, Andre; and Coussediere, Daniel, 3,975,413.

Cowan, John Richard: *See—*
Dunn, James Grant; Cowan, John Richard; and Russo, Anthony Joseph, 3,975,587.

Cowley, Gerald, to Erco Industries Limited. Production of chlorine dioxide. 3,975,506, Cl. 423-478.000.

Crathorne, Elizabeth Anne; Howell, Ian Valentine; and Pitkethly, Robert Chalmers, to British Petroleum Company Limited, The. Production of acid hydrocarbon conversion catalysts. 3,975,299, Cl. 252-432.000.

Crisp, Robert L., Jr., to Facet Enterprises, Inc. Filter Products Division. Differential pressure indicating device. 3,974,795, Cl. 116-114.0PV.

Criswell, Homer C. Curtain wall gasket. 3,974,613, Cl. 52-400.000.

Crocker, Thomas H.: *See—*
Levitt, Barry N.; Crocker, Thomas H.; and Chapman, Everett E., 3,975,625.

Crook, Monty Frederick: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,975,465.

Cross, Christopher G.; Kirk, Charles E.; and Molnar, James R., to PPG Industries, Inc. Package for a rolled continuous sheet material. 3,974,914, Cl. 206-408.000.

Crough, Donald E.: *See—*
Peterson, Harley G.; and Crough, Donald E., 3,975,173.

Crowe, Alan; and Fry, David Philip, to PB Chemicals International Limited. Thermosetting moulding compositions. 3,975,353, Cl. 260-40.00R.

Crown Cork & Seal Company, Inc.: *See—*
Wood, Lee A., 3,974,998.

Crozier, Ronald David: *See—*
Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, 3,975,264.

Curtil, Remi, to Motosacoche S.A. Explosion engine with several combustion chambers. 3,974,804, Cl. 123-59.0BM.

Dahle, Orvar: *See—*
Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, 3,975,685.

Dai Nippon Printing Company Limited: *See—*
Tsukino, Yoshio, 3,974,747.

Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., to United States of America, Agriculture. Phosphorus and nitrogen containing resins for flameproofing organic textiles. 3,975,560, Cl. 427-341.000.

Daikin Kogyo Co., Ltd.: *See—*
Watanabe, Shiro; Maruo, Keiichi; and Ono, Hiroshi, 3,975,181.

Daily, Thomas E.; Stanford, Charles O.; and Hinners, William L., to Fedders Corporation. Dryer having improved heating system. 3,974,573, Cl. 34-48.000.

Daiwa Boseki Kabushiki Kaisha: *See—*
Morikawa, Takashi; Kihara, Hidetoshi; Urifu, Tohru; and Takahashi, Hisateru, 3,974,635.

D'Amico, James J., to Flex, Incorporated. Face seal. 3,975,027, Cl. 277-84.000.

Danfoss A/S: *See—*
Hallgreen, Knud Julius; and Iversen, Poul Christian Carlos, 3,975,620.

Danko-Arlington, Inc.: *See—*
Danko, Joseph O., Jr., 3,974,706.

Danko, Joseph O., Jr., to Danko-Arlington, Inc. Lead screw coupling assembly. 3,974,706, Cl. 74-89.150.

Danneberg, Peter: *See—*
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; and Danneberg, Peter, 3,975,525.

Darbyshire, Joan Elizabeth: *See—*
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,975,520.

Dardik, Herbert: *See—*
Dardik, Irving I.; and Dardik, Herbert, 3,974,526.

Dardik, Irving I.; and Dardik, Herbert. Vascular prostheses and process for producing the same. 3,974,526, Cl. 3-1.400.

Darskus, Rolf: *See—*
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, 3,975,527.

Dautzenberg, Norbert: *See—*
Grebe, Klaus; de Haas, Hans; Dautzenberg, Norbert; and Hewing, Josef, 3,975,186.

Davidson, Clara A., executrix: *See—*
Paulson, William T.; Davidson, David M., deceased; Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., 3,975,559.

Davidson, David M., deceased: *See—*
Paulson, William T.; Davidson, David M., deceased; Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., 3,975,559.

Davie, Walter C., to Xerox Corporation. Dynamic braking for a three phase motor. 3,975,668, Cl. 318-212.000.

Davies, James Francis; Gilbert, Philip Alan; and Thompson, Laurence, to Lever Brothers Company. Detergent compositions. 3,975,312, Cl. 252-535.000.

Davis, Bryan Terence: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,975,465.

Davis, Frederick, to RPR, Inc. High temperature non-crystallizing cholesteric liquid crystal compositions. 3,975,288, Cl. 252-299.000.

Davis, Sheridan; and Cheever, Donald C., to United States of America, Navy. Conical face-seal for an electrical feedthrough. 3,975,579, Cl. 174-18.000.

Davison, Sol; and Wales, Michael, to Shell Oil Company. Blends of certain hydrogenated block copolymers with ABS polymers. 3,975,460, Cl. 260-876.00B.

Dawson, Peter L. Diaphragm valves. 3,974,849, Cl. 137-221.000.

De Laval Separator Company, The: *See—*
Fuchs, Hubert K. E., 3,975,469.

Deane, Thomas N.: *See—*
Claunch, Robert W.; Deane, Thomas N.; Rogan, Patrick D. M.; Powe, Carl M.; and Werner, Mark, 3,974,528.

Deere & Company: *See—*
Bertrand, Raymond; Tenaud, Jean; and Grabowski, Rene, 3,974,970.

DeFranco, Robert Jay; and Scribner, Richard M., to Du Pont de Nemours, E. I., and Company. 1,5-Disubstituted-2-pyrrolidinones, -3-pyrrolin-2-ones, and -4-pyrrolin-2-ones. 3,975,399, Cl. 260-326.200.

de Gennes, Marie Alfred Gerard, to Societe Anonyme Francaise du Ferodo. Resilient torsion dampeners for clutch discs. 3,974,903, Cl. 192-106.200.

de Groot, Sebastian J. Floating structures including honeycomb cores formed of elongate hexagonal cells. 3,974,789, Cl. 114-.50F.

de Haas, Hans: *See—*
Grebe, Klaus; de Haas, Hans; Dautzenberg, Norbert; and Hewing, Josef, 3,975,186.

Deisting, Horst, to Pitney-Bowes, Inc. Sheet feeding device. 3,975,013, Cl. 271-275.000.

Delvernois, Philip J., Jr.: *See—*
Noble, Peter M.; and Delvernois, Philip J., Jr., 3,974,963.

Delvernoise, Philip J., Jr., to Westinghouse Air Brake Company. Railway antinoise pollution arrangements. 3,974,776, Cl. 104-26.00A.

Dejouhanet, Jean-Pierre; and Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Infomatique. Thin film magnetic heads. 3,975,773, Cl. 360-126.000.

Delang, Theodore G., to American Sterilizer Company. Packaging and dispensing carton. 3,974,956, Cl. 229-20.000.

Delaunois, Yvon; and Wilante, Claude, to Tessenderlo Chemie S.A. Halogenated aralkyl ethers. 3,975,448, Cl. 260-611.00A.

Delayre, Jean: *See—*
Dunand, Jean-Jacques; and Delayre, Jean, 3,975,675.

della Porta, Paolo; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, to S.A.E.S. Getters S.p.A. Coating a substrate with soft particles. 3,975,304, Cl. 252-463.000.

DeLucia, Philip A. Collapsible enclosure for lavatories or the like. 3,975,069, Cl. 312-262.000.

De Micheli, Pietro: *See—*
Arcari, Giuliana; De Micheli, Pietro; Luini, Fulvio; and Scarponi, Ugo, 3,975,389.

Demole, Edouard: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,975,310.

Denyo Kabushiki Kaisha: *See—*
Konishi, Shinichi, 3,975,615.

Derbyshire, George Cecil, to Jacobs Manufacturing Company Limited, The. Hand tools. 3,974,868, Cl. 145-24.000.

D'Ercole, Augustine D., to General Foods Corporation. Process of making a dry-free-flowing beverage mix and product. 3,975,547, Cl. 426-106.000.

Deriblé, Pierre Henri; Torelli, Vesperto; and Dumont, Claude, to Rousel-UCLAF. Diebenzo(B,E)thiepines. 3,975,529, Cl. 424-265.000.

Derighetti, Renato: *See—*
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, 3,975,607.

Derreumaux, Antoine: *See—*
Saunier, Bernard; and Derreumaux, Antoine, 3,975,271.

DeSoto, Inc.: *See—*
Smyk, Rostyslaw R.; and Rabi, Rafat T., 3,975,314.

DeTolla, Francis Louis: *See—*
Brown, Henry Bispham; and DeTolla, Francis Louis, 3,975,112.

De Vries, Hilbert: *See—*
Van Baasbank, Pieter; Flendrig, Hubertus A.; and De Vries, Hilbert, 3,974,757.

de Vrieze, Christiaan G., to Stamicarbon B.V. Process for the addition of additives to thermoplastics. 3,975,326, Cl. 260-23.00H.

Dickens, Elmer D., Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,975,359, Cl. 260-45.75A.

Dickens, Elmer Douglas, Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,975,356, Cl. 260-45.70S.

Didier Engineering GmbH: *See—*
Seeberg, Horst; and Fach, Horst, 3,975,240.

Diepeveen, John C. Mechanism for incremental movement of vertical frame. 3,975,143, Cl. 432-5.000.

Diesel Kiki Kabushiki Kaisha: *See—*
Yajima, Kenichi, 3,974,810.

Dietrich, Karl-Heinz: *See—*
Hofmann, Wilfried; Dietrich, Karl-Heinz; Rauffer, Walter; Schuhmeir, Eugen; and Kohler, Reinhard, 3,975,749.

Dietz, Earl D., to Owens-Illinois, Inc. Composition for use as a filler in tooth filling and facing composition and method of making the same. 3,975,203, Cl. 106-299.000.

Digital Equipment Corporation: *See—*
Spash, John L.; and Rottmayer, Robert, 3,975,770.

Distler, Walter; Kraus, Helmut; Schwarz, Christian; and Schmidt, Oskar, to Siemens Aktiengesellschaft. Liquid jet recorder. 3,975,740, Cl. 346-75.000.

Ditcher, John, to A-Lok Corporation. Apparatus for forming steps in manholes and the like. 3,974,615, Cl. 52-698.000.

Dobson, Geoffrey Townsend; and Chamberlain, Sidney George, to British Aircraft Corporation. Control of guided missiles. 3,974,984, Cl. 244-3.110.

Dobson, John J.: *See—*
Schisselbauer, John C.; Dobson, John J.; and Gerhart, James E., 3,975,010.

Dobson, Kenneth Rowland, to BP Chemicals International Limited. Halogenated esters of aliphatic dicarboxylic acids. 3,975,364, Cl. 260-485.00H.

Dr. -Ing. Rudolf Hell GmbH: *See—*
Taudt, Heinz; and Gast, Uwe, 3,975,761.

Doelp, Louis C., to Air Products and Chemicals, Inc. Hydrodesulfurization of liquid hydrocarbon utilizing a suspended catalyst particle of less than 10 microns. 3,975,259, Cl. 208-213.000.

Domaracki, John F.; McBride, Leonard M.; and Wack, Frank, to International Tools (1973) Ltd. Child resistant safety closure and container assembly. 3,974,928, Cl. 215-211.000.

Domaracki, John F.: *See—*
Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,975,108.

Dominick, George G.; Erickson, Kenneth H.; and Price, Richard M., to Qonaar Corporation. Door lock for cash acceptance receptacle. 3,974,961, Cl. 232-16.000.

Domtar Limited: *See—*
Meiel, Samuel P.; and Sherry, Cameron W., 3,974,548.

Dorschner, Kenneth P.: *See—*
Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., 3,975,541.

Double, Steve P.: *See—*
Holmes, Dennis K., 3,974,975.

Douglas, Edward Curtis: *See—*
Mueller, Charles William; and Douglas, Edward Curtis, 3,974,560.

Dounchis, Harry; and Lee, Fui-Tseng H., to FMC Corporation. Activation of peroxygen bleaches using isophorone enol acetates and isophorone oximinoacetate. 3,975,153, Cl. 8-111.000.

Dover Findings, Inc.: *See—*
Little, Paul V., 3,974,547.

Dow Chemical Company, The: *See—*
Budny, Thomas F., 3,974,947.
Kuchek, Henry A., 3,975,557.
McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., 3,975,433.
Pawloski, Chester E., 3,975,393.
Tigner, Reuben A.; and Mounts, Lewis S., 3,975,493.

Dow Corning Corporation: *See—*
Bennett, Donald R.; and McHard, James A., 3,975,521.
Falender, James R.; Lindsey, Sarah E.; Ward, Andrew H.; and Kendrick, Thomas C., 3,975,455.
Kim, Yung K.; and Riley, Michael O., 3,975,362.
Kummins, Joel S.; and Smith, John C., Jr., 3,975,554.

Doyle, Edward J.; and Bartram, Nial C., to Schick Incorporated. Portable hooded hair moisturizer and dryer. 3,974,840, Cl. 132-9.000.

Dracon Industries: *See—*
Mason, John Richard, 3,975,075.

Dravo Corporation: *See—*
Briggs, Aubrey C., 3,975,044.

Dryburgh, Paul E., to Universal Electric Company. Shaded pole motor. 3,975,654, Cl. 310-172.000.

Du Pont of Canada Limited: *See—*
Gray, Peter Harrison; Row, Grant David; and Stinson, John David, 3,974,942.

Duchemin, Michel Leon, to Ressorts du Nord S.A. Vehicle suspension spring. 3,975,005, Cl. 267-47.000.

Duerr, Dieter, to Ciba-Geigy AG. 4-Bromo-3-chloro-phenylisocyanate. 3,975,418, Cl. 260-453.0AR.

Dumont, Claude: *See—*
Deriblé, Pierre Henri; Torelli, Vesperto; and Dumont, Claude, 3,975,529.

Dumoulin, Jean, to Rhone-Poulenc S.A. Surface active composition. 3,975,294, Cl. 252-354.000.

Dunand, Jean-Jacques; and Delayre, Jean, to Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.E.C.A.). Impulse response magnetic resonance spectrometer. 3,975,675, Cl. 324-.50A.

Duncan, Ernest R. Teaching machine. 3,974,575, Cl. 35-9.00A.

Dunham, Charles W. Gun sight night lighting attachment. 3,974,585, Cl. 42-1.00S.

Dunn, Daniel Lincoln: *See—*
Blakesley, Roland Francis; and Dunn, Daniel Lincoln, 3,975,079.

Dunn, James Grant; Cowan, John Richard; and Russo, Anthony Joseph, to International Telephone and Telegraph Corporation. Digital vocoder. 3,975,587, Cl. 179-1.0SA.

Du Pont de Nemours, E. I., and Company: *See—*
Cash, Donald Edwin, 3,975,500.
Coulson, Dale Robert; and Seiwell, Linda P., 3,975,415.
DeFranco, Robert Jay; and Scribner, Richard M., 3,975,399.
Foley, Joe Alvin, 3,975,475.
Goodfellow, Kenneth A., 3,974,989.
Hyson, Archibald Miller, 3,975,518.
Klabunde, Ulrich, 3,975,438.
Klabunde, Ulrich, 3,975,439.
Knoth, Walter Henry, Jr.; and Mrowca, Joseph John, 3,975,447.
Langsdorf, William P., 3,975,464.
Mahler, Eddie G.; McAllister, Patrick R.; and Wilhoit, Eugene D., 3,975,502.
Ranck, Ralph Oliver, 3,975,573.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. N-cyano-N'-heterocyclic-alkyl quanidine inhibitors of H_2 histamine receptors. 3,975,530, Cl. 424-270.000.

Durden, John G., III. Disposable electrosurgical cautery having optional suction control feature. 3,974,833, Cl. 128-275.100.

Durin, Michel: *See—*
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, 3,975,608.

Dutil, Joseph Andre Raymond. Truck bed panels. 3,975,046, Cl. 296-28.00M.

Dworak, Wilhelm; and Muller, Karl-Heinz, to Robert Bosch G.m.b.H. Gear motor with valve controlled pressure biased end seals for facilitatng starting of the gear motor. 3,975,124, Cl. 418-132.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Finsterwalder, Klemens, 3,975,476.

Dynapol: *See—*
Weinshenker, Ned M., 3,975,334.

E. & J. Gallo Winery: *See—*
Larkin, Kenneth A., 3,975,633.

E-P Products, Inc.: *See—*
Andresen, John H., Jr., 3,975,703.

Earl & Wright: *See—*
Burnell, Anthony John; and Grant, Robert, 3,974,792.

Eastman Kodak Company: *See—*
Palmer, Billy W.; Bondurant, David L.; and Hagemeyer, Hugh J., Jr., 3,975,450.
Swanke, Thaddeus; Montalto, Michael S.; and Morse, John E., 3,974,952.
Watkins, Windell C., 3,975,301.
Yoerger, William E.; McCabe, John M.; and Wright, John F., 3,975,352.

Eaton, George H. Monitory closure sealing mechanisms for storage facilities. 3,974,937, Cl. 220-239.000.

Eaton, Homer L., to Eaton-Leonard Corporation. Tube bending machine and carriage therefor. 3,974,676, Cl. 72-307.000.

Eaton-Leonard Corporation: *See—*
Eaton, Homer L., 3,974,676.

Eberle, Arthur C.; Venendaal, Robert G.; and Munk, William D., to Columbia Gas Service Corporation. Remote digital indicator attachment for a gas meter. 3,974,694, Cl. 73-272.00A.

Ebner, Theran L.; and Hawkins, Donald W., to Houston Natural Gas Corporation. Transponder for transmitting data from digital encoding transducers over a telephone line. 3,975,589, Cl. 179-2.0AM.

Ecchuya, Masao, to Mitsuyoshi Hamasu. Padding for mattresses and like articles. 3,974,532, Cl. 5-345.00R.

Eckert, Robert C., to Westvaco Corporation. Three stage process for pulping lignocellulosic materials including a cyanide ion containing first stage. 3,975,232, Cl. 162-65.000.

Economy, James: *See—*
Cottis, Steve G.; Economy, James; and Wohrer, Luis C., 3,975,487.

Edelman, Leonard E.: *See—*
Reinshagen, H. Alan; and Edelman, Leonard E., 3,975,322.

Edison, Timothy. Sliding panel lock. 3,975,041, Cl. 292-258.000.

Edwards, Murel C. Oil sampling and charging method and apparatus for refrigeration systems. 3,974,659, Cl. 62-84.000.

Edwin Cooper & Company Limited: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,975,465.

Eftefield, Larry G., to Caterpillar Tractor Co. Cellular bulldozer blade with built-in support brackets. 3,974,882, Cl. 172-803.000.

Eggleton, Reginald C.; and Johnston, Kenneth W., to Indianapolis Center for Advanced Research, Inc. non-profit. Display circuitry for ultrasonic imaging. 3,974,826, Cl. 128-2.00V.

Egli, Emil; and Landwehrkamp, Hans, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Apparatus for forming a reserve winding on a yarn spool. 3,974,972, Cl. 242-18.0PW.

Eheim, Franz, to Robert Bosch G.m.b.H. Speed regulator for fuel injection pumps. 3,974,814, Cl. 123-139.0ST.

Eholzer, Ulrich: *See—*
Schubart, Rudiger; and Eholzer, Ulrich, 3,975,333.

Eibl, Volker; and Reis, August, to Sachs-Systemtechnik GmbH. Method of disinfecting water. 3,975,246, Cl. 204-151.000.

Einhorn, Rudiger, to Coats & Clark, Inc. Method of making hard wall fastener. 3,974,557, Cl. 29-418.000.

Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Muller, Anton; and Konig, Hubert, 3,974,871.

Eiter, Karl, to Bayer Aktiengesellschaft. Preparation of cis-7,8-epoxy-2-methyloctadecane. 3,975,409, Cl. 260-348.50L.

Eitzen, Vincent E.: *See—*
Moore, Robert R.; and Eitzen, Vincent E., 3,975,001.

Elbert, Raymond John; and Butcher, Alan De Vere, to Union Carbide Corporation. Graded metal-to-ceramic structure for high temperature abradable seal applications and a method of producing said. 3,975,165, Cl. 29-182.200.

Elco, Richard A.; Bauer, James A.; and Treese, Willard E., to Westinghouse Electric Corporation. Forward-reverse pulse cycling anodizing and electroplating process power supply. 3,975,254, Cl. 204-228.000.

Elcon Manufacturing Company Limited: *See—*
Beatty, Gordon Wesley; and Young, Douglas Charles, 3,974,605.

Elfab Corporation: *See—*
Ammon, John Preston, 3,975,072.
Ammon, John Preston, 3,975,078.

Eli Lilly and Company: *See—*
Stephan, Erwin A., 3,975,542.
Stephan, Erwin A., 3,975,543.

Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi: *See—*
Rencin, Miloslav; Rod, Josef; and Seidl, Pavel, 3,974,665.

Elkem-Spigerverket A/S: *See—*
Krogsrud, Harald, 3,975,575.
Krogsrud, Harald, 3,975,576.

Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, to Edwin Cooper & Company Limited. Heterocyclic phosphorus compounds. 3,975,465, Cl. 260-927.00R.

Ellis, Clarence Eugene. Cooking apparatus. 3,974,760, Cl. 99-482.000.

Ellis, Emily W., to Simplex Cutting Machine Company, Inc. Adjustable cutting machine. 3,974,565, Cl. 30-376.000.

Ellis Industries, Inc.: *See—*
Ellis, Lawrence D.; and Evans, Robert E., 3,974,537.

Ellis, Lawrence D.; and Evans, Robert E., to Ellis Industries, Inc. Lip extender for loading dock levelers. 3,974,537, Cl. 14-71.300.

Elo, Heikki K. Material separation apparatus and method. 3,975,263, Cl. 209-138.000.

Eltra KG Leicht & Trambauer: *See—*
Hammecke, Michael, 3,974,993.

Emblem, Harold Garton; and McPherson, John Andrew, to Zirconal Processes Limited. Rigid coherent gel. 3,975,202, Cl. 106-65.000.

Emco Wheaton Inc.: *See—*
Fenton, David T.; and Bower, Allen M., 3,974,865.

Emerson Electric Co.: *See—*
Baysinger, Robert L.; and Newport, Harry E., Jr., 3,975,136.
Kinsella, Howard R.; and Fernstrom, Carl F., 3,975,135.
Meyer, Elwyn A., 3,974,738.

EMI Limited: *See—*
Payne, Robert William, 3,975,734.
Simmons, John Ernest, 3,974,625.

Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,975,530.

Emtage, Peter R.; Nalepa, Philip J.; and Miller, Robert C., to Westinghouse Electric Corporation. Mass of current inrush limiters. 3,975,658, Cl. 315-71.000.

Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, to Bayer Aktiengesellschaft. Pharmaceutical compositions useful for treating tick infestation in animals which contain 2-aryliminopyrrolidines or their salts as the active agent. 3,975,534, Cl. 424-274.000.

Endo, Kazuo: *See—*
Yamawaki, Takeshi; Hayashi, Masahiro; and Endo, Kazuo, 3,975,461.

Engel, Lewis O., to General Filters, Inc. Humidifier having a water distributor trough. 3,975,470, Cl. 261-106.000.

Erb, Ernst, to Erba Maschinenbau AG. Method and device for electronic scanning of control-fields of a control member on cylinder and straight bar knitting machines. 3,974,664, Cl. 66-154.00A.

Erba Maschinenbau AG: *See—*
Erb, Ernst, 3,974,664.

Erco Industries Limited: *See—*
Cowley, Gerald, 3,975,506.

Erdley, Harold F., to Teledyne Industries, Inc. Spin coupled, angular rate sensitive inertial sensors with optional acceleration sensing capability and method of fabricating same. 3,974,701, Cl. 73-504.000.

Erdody, Robert G.; Harmon, Paul E.; and Tetro, Richard S., to Black Clawson Company, The. Apparatus for cutting a web of sheet material. 3,974,723, Cl. 83-18.000.

Erickson, Bruce G., to American Micro-Systems, Inc. Crystal ranging apparatus for determining range within which resonant frequency of crystal lies. 3,975,678, Cl. 324-56.000.

Erickson, Kenneth H.: *See—*
Dominick, George G.; Erickson, Kenneth H.; and Price, Richard M., 3,974,961.

Erico Rail Products Company: *See—*
Geiger, Willard L., 3,974,991.

Erjavec, John: *See—*
Mina, George Louis; and Erjavec, John, 3,975,394.

Erway, Duane: *See—*
Green, Dale; Erway, Duane; Condon, Robert; Schoonover, William C.; and Rowe, Norman L., 3,975,748.

Eschwey, Helmut: *See—*
Burchard, Walther; and Eschwey, Helmut, 3,975,339.

Esterline Corporation: *See—*
Mayfield, Glenn A., 3,975,682.

Estrada, Henry F., to Budd Company, The. Changeable gauge railing truck. 3,974,780, Cl. 105-178.000.

Etchells, Sylvia, to Imperial Chemical Industries Inc. Plasticizers as adhesion promoters in polyester/polyamide heterofilaments. 3,975,351, Cl. 260-30.80R.

Ethyl Corporation: *See—*
LaBorde, Joseph N., 3,974,606.
Perilstein, Warren L., 3,975,279.

Eto, Yoshizumi: *See—*
Sato, Kazuhiro; Ishibashi, Shizuka; and Eto, Yoshizumi, 3,975,657.

Evans, Robert E.: *See—*
Ellis, Lawrence D.; and Evans, Robert E., 3,974,537.

Ewen, Harold I.; and Haroules, George G., to United States of America, Transportation. Radio theodolite angle measuring apparatus. 3,975,736, Cl. 343-113.00R.

Exxon Research and Engineering Company: *See—*
Bushnell, James D.; and Ryan, Douglas G., 3,975,396.
Gorbaty, Martin L., 3,975,168.
Nelson, Richard L., 3,975,590.

Eyles, Martin Keith; and Pout, Christopher Ronald, to British Petroleum Company Limited, The. Desulphurization catalysts. 3,975,303, Cl. 252-462.000.

F. Knobel Elektro-Apparatebau AG: *See—*
Knobel, Fritz; and Meili, Ernst, 3,975,660.

F. L. Russell Corporation: *See—*
Cline, Robert C., 3,975,105.

F. L. Smithe Machine Company, Inc.: *See—*
Bethke, Erwin, 3,974,748.

Fa. Zahnraderfabrik Renk AG: *See—*
Wolf, Albin; and Weigant, Franz, 3,974,595.

Fabbrini, Riccardo: *See—*
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, 3,975,180.

Fabrique Nationale Herstal S.A.: *See—*
Bourlet, Maurice V., 3,974,739.

Facet Enterprises, Inc. Filter Products Division: *See—*
Crisp, Robert L., Jr., 3,974,795.

Facet Enterprises, Inc. Motor Components Division: *See—*
Strozinski, Anthony John, 3,974,703.

Fach, Horst: *See—*
Seeberg, Horst; and Fach, Horst, 3,975,240.

Fahrbach, Gerhard: *See—*
Schmidt, Franz; Fahrbach, Gerhard; Schenk, Wolfgang; and Seiler, Erhard. 3,975,459.

Falconbridge Nickel Mines Limited: *See—*
Haugen, Leif R., 3,975,189.

Falender, James R.; Lindsey, Sarah E.; Ward, Andrew H.; and Kendrick, Thomas C., to Dow Corning Corporation. Altering gas permeabilities of polymeric material. 3,975,455, Cl. 260-827.000.

Fancher, Llewellyn W., to Stauffer Chemical Company. 2,4-Dichlorophenoxyacetyl thiolcarbamate hydrazines. 3,975,419, Cl. 260-455.00A.

Fantuzzo, Joseph, to Xerox Corporation. Quadrangular trihelicoid gravure roll. 3,974,554, Cl. 29-121.400.

Farinelli, Robert: *See—*
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, 3,975,608.

Farnand, Joseph Redmond; and Puddington, Ira Edwin, to Canadian Patents and Development Limited. Formation of hollow spherical articles. 3,975,194, Cl. 75-222.000.

Farr, James B., to Tecumseh Products Company. Power supply for refrigeration units. 3,974,660, Cl. 62-229.000.

Farris, Jr.; Clyde A. Diaphragm pump having auxiliary chamber. 3,975,119, Cl. 417-434.000.

Fastert, Herbert; John, Wolfgang; and Backhaus, Karl L., to Concast Incorporated. Continuous casting plant. 3,974,874, Cl. 164-281.00R.

Faulstich, George W., to Three Sisters Ranch Enterprise. Cap with tear strip for container necks. 3,974,932, Cl. 215-256.000.

Fechner, Patrice: *See—*
Billottet, Henri; and Fechner, Patrice, 3,974,740.

Fedders Corporation: *See—*
Daily, Thomas E.; Stanford, Charles O.; and Hinners, William L., 3,974,573.

Feichtner, John D.: *See—*
Mego, Alexander, Jr.; and Feichtner, John D., 3,975,692.

Feild, Eugene P.; and Bergstedt, Donald C., to FNB Products, Inc. Pressure responsive fluid valve assembly. 3,975,116, Cl. 417-311.000.

Fendler, George W.: *See—*
Van Vliet, Edward; Fendler, George W.; and Himmelberger, Lynn, 3,974,574.

Fengler, Richard R.: *See—*
Fengler, Werner H.; and Fengler, Richard R., 3,974,558.

Fengler, Werner H.; and Fengler, Richard R. Method of installing annular seal for coaxial tubular member. 3,974,558, Cl. 29-451.000.

Fenton, David T.; and Bower, Allen M., to Emco Wheaton Inc. Vapor collecting nozzle. 3,974,865, Cl. 141-311.00R.

Ferdelman, Donald C.; and Loos, John H., to General Motors Corporation. Subbase for room air conditioner wall sleeve. 3,974,661, Cl. 62-262.000.

Ferdinant Lusch KG: *See—*
Lusch, Peter; and Horenkamp, Franz, 3,974,530.

Fernstrom, Carl F.: *See—*
Kinsella, Howard R.; and Fernstrom, Carl F., 3,975,135.

Ferranti-Packard Limited: *See—*
Winrow, Donald, 3,975,728.

Ferrario, Bruno: *See—*
della Porta, Paolo; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,975,304.

Ferroni, Bernardo: *See—*
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, 3,975,607.

Fessler, William A., to General Electric Company. Polyamideimides and method for making. 3,975,345, Cl. 260-29.20N.

Fey, Maurice G.: *See—*
Harvey, Francis J., II; and Fey, Maurice G., 3,975,188.

Ffooks, Roger Cambridge, to Conch Lng (General Partnership). Storage containers for liquefied gases. 3,974,935, Cl. 220-9.0LG.

F'Geppert, Erwin, to United States of America, Army. Constant force belt tensioner. 3,974,708, Cl. 74-242.10A.

Fiber Industries, Inc.: *See—*
Patterson, Joseph H., 3,975,488.

Fick, Herbert, to Siemens Aktiengesellschaft. Time division multiplex system and method for the transmission of binary data. 3,975,593, Cl. 179-15.0BV.

Fieni, Walter, to Societe Anonyme Francaise du Ferodo. Device for a buckle type safety belt for vehicle. 3,974,979, Cl. 242-107.40R.

Figueroa, Luisito A. Parlor game device. 3,975,022, Cl. 273-141.00A.

Filan, A. LaVerne: *See—*
Filan, Alton N.; and Filan, A. LaVerne, 3,974,880.

Filan, Alton N.; and Filan, A. LaVerne. Drawbar assembly. 3,974,880, Cl. 172-443.000.

Filli S.p.A.: *See—*
Vinci, Fernando; and Morandi, Dino, 3,974,663.

Finegold, Hyman B.: *See—*
Reiger, Arthur C., Jr.; and Finegold, Hyman B., 3,974,553.

Finike Italiana Marposs-Soc. In Accomandita Semplica di Mario Possati & C.: *See—*
Albertazzi, Gastone, 3,974,569.

Finsterwalder, Klemens, to Dyckerhoff & Widmann Aktiengesellschaft. Method for building a cable-stayed girder bridge. 3,975,476, Cl. 264-33.000.

Fioriti, Joseph Anthony; and Mancuso, John Joseph, to General Foods Corporation. Plastically deformable ready-to-use batter. 3,975,550, Cl. 426-553.000.

Firestone Tire & Rubber Company, The: *See—*
Spiewak, John W., 3,975,331.
Walker, Ronald J., 3,974,546.

Firmenich S.A.: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,975,310.

First National Bank of Decatur, Alabama: *See—*
Meadows, Talmadge W., 3,975,583.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicide mixtures of 3-lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides and thiazoles. 3,975,179, Cl. 71-90.000.

Fischer, Caecilia Emma, legal representative: *See—*
Fischer, Adolf, deceased, 3,975,179.

Fischli, Albert Eduard: *See—*
Mayer, Hans Johann; Fischli, Albert Eduard; Klaus, Michael Josef; and Wick, Alexander Eduard, 3,975,406.

Fisher, Lewis M.; and Williams, Joseph A., to Hydrodyne Development Company. Pump control system. 3,975,115, Cl. 417-38.000.

Fisons Limited: *See—*
Stevenson, Neil Arthur; and Wardell, George, 3,975,536.

Fitzmayer, Louis H., to General Electric Company. Food thermometer for microwave oven. 3,974,696, Cl. 73-352.000.

Fitzmayer, Louis H.: *See—*
Chen, David Y.; and Fitzmayer, Louis H., 3,975,720.

Fives-Cail Babcock Societe Anonyme: *See—*
Pacault, Pierre Henri, 3,974,642.

Fleming, Paul L., to Communicatons Satellite Corporation (Comsat). Planar transmission line comprising a material having negative differential conductivity. 3,975,690, Cl. 330-5.000.

Flendrig, Hubertus A.: *See—*
Van Baasbank, Pieter; Flendrig, Hubertus A.; and De Vries, Hilbert, 3,974,757.

Fletcher, Horace; Malis, Jerry L.; and Yardley, John P., to American Home Products Corporation. Benzylamine narcotic antagonists. 3,975,436, Cl. 260-570.50R.

Flex, Incorporated: *See—*
D'Amico, James J., 3,975,027.

Flinchum, Charles: *See—*
Pierson, Marvin B.; and Flinchum, Charles, 3,975,556.

Florian, John, to Mobil Oil Corporation. Method of forming recesses in thermoplastic tray. 3,974,722, Cl. 83-1.000.

Flowers, Carl C.: *See—*
Hambrick, Lester N.; and Flowers, Carl C., 3,974,597.

Fluid Energy Processing & Equipment Co.: *See—*
Van Vliet, Edward; Fendler, George W.; and Himmelberger, Lynn, 3,974,574.

Flynn, Gardner, to Nalco Chemical Company. Method for improving sewage sludge incineration. 3,974,783, Cl. 110-8.00R.

FMC Corporation: *See—*
Dounchis, Harry; and Lee, Fui-Tseng H., 3,975,153.
Walden, John, 3,975,499.

FNB Products, Inc.: *See—*
Feild, Eugene P.; and Bergstedt, Donald C., 3,975,116.

Foley, Joe Alvin, to Du Pont de Nemours, E. I., and Company. Wiping spinneret face with cooled wiper. 3,975,475, Cl. 264-28.000.

Foley, Simon: *See—*
Bentley, John Richard; and Foley, Simon, 3,974,624.

Foote Mineral Company: *See—*
Smith, William Novis, Jr., 3,975,453.

Ford, David Julian, to TRW Inc. Fluid level sensing probe. 3,975,582, Cl. 174-153.00R.

Ford Motor Company: *See—*
Allison, William D., 3,975,038.
Heitert, John S., 3,974,808.
Labana, Santokh S.; and Peng, Stephen C., 3,975,456.
Toohey, Raymond F. 3,974,713.

Formica Corporation: *See—*
Power, George Edward, 3,975,572.

Forney Engineering Company: *See—*
Horn, Robert; and Slovacek, Raymond J., 3,975,622.

Fosness, John P.; and Odor, Louis, to Rockwell International Corporation. Titanium parts manufacturing. 3,974,673, Cl. 72-38.000.

Foster, Betty Jane; Langston, Perry Robert, Jr.; and Tummala, Rao Ramamohana, to International Business Machines Corporation. Process for increasing the strength of sealing glass. 3,975,175, Cl. 65-31.000.

Foster Grant Co., Inc.: *See—*
Leblanc, Conrad L., 3,975,474.

Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, to Compagnie Des Terminaux Marins Coterm; and Spetsialnoe Konstruktorskoe Bjuro "Transnefteavtomatika". Device for loading and unloading cargo vessels for conveying gaseous, liquid or fluidized solid materials. 3,974,864, Cl. 141-100.000.

Fowler, John H.: *See—*
Herd, David P.; and Fowler, John H., 3,974,875.

Fowler, John T., to Lairam Corporation, The. Digital compass averaging circuit. 3,975,621, Cl. 235-150.260.

Fox, John William, to P.C.S. Developments Limited. Safety seat belts for vehicle occupants. 3,975,258, Cl. 280-733.000.

Fradin, Maurice, to Agence Nationale de Valorisation de la Recherche (ANVAR). Pulverizing process for the production of frozen minced meat. 3,975,548, Cl. 426-513.000.

Frahm, Carl E.; and Frahm, Shirley E. Valved water container with seal. 3,974,863, Cl. 141-18.000.

Frahm, Shirley E.: *See*—
Frahm, Carl E.; and Frahm, Shirley E., 3,974,863.

Francque, Marc: *See*—
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,975,534.

Franer, Victor R.; and Burman, Darrell C., to Minnesota Mining and Manufacturing Company. Image transfer sheet material. 3,975,563, Cl. 428-143.000.

Frank, Willi, to Hauni-Werke Korber & Co., KG. Method and apparatus for neutralizing electrostatic charges of filter material for smokers' products. 3,974,750, Cl. 93-77.0FT.

Franklin, Robert S. Lifesaving device. 3,974,536, Cl. 9-14.000.

Franz, Albert, to Hermann Stribel KG. Differential relay arrangement for determining when one of two cooperating lamps, particularly vehicle lamps, is not operating. 3,975,721, Cl. 340-251.000.

Fraser, David Bruce; and Lou, David Yuan Kong, to Bell Telephone Laboratories, Incorporated. High-resolution sputter etching. 3,975,252, Cl. 204-192.000.

Fratmann S.A.: *See*—
Kuenzy, Fred, 3,975,402.

Frazierr, James L., to Houdaille Industries, Inc. Z-axis drive assembly. 3,975,109, Cl. 408-35.000.

Frederick, Leland L.: *See*—
McCullough, John F.; and Frederick, Leland L., 3,975,178.

Freedman, Paul M.: *See*—
Barry, James D.; and Freedman, Paul M., 3,975,693.

Freeport Minerals Company: *See*—
Matson, Rapheal Fritz, 3,975,507.
Wiewiorowski, Tadeusz K.; and Miller, David J., 3,975,497.

Frick, Roger L., to Rosemount Inc. Transducer for converting a varying reactance signal to a DC current signal. 3,975,719, Cl. 340-200.000.

Fricker, Paul: *See*—
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, 3,975,608.

Fritsch, Horst, to LEWA Herbert Ott Kommanditgesellschaft. Pump driving mechanism with adjustable stroke. 3,974,714, Cl. 74-571.00L.

Fritzsche Dodge & Olcott Inc.: *See*—
Kulka, Kurt; and Zazula, Teodosij, 3,975,309.

Froix, Michael F., to Xerox Corporation. Charge transfer complexes of ferrocenes having light filtering properties. 3,975,289, Cl. 252-300.000.

Fry, David Philip: *See*—
Crowe, Alan; and Fry, David Philip, 3,975,353.

Fuchs, Hubert K. E., to De Laval Separator Company, The. Device for revolving liquids and supplying gas thereto. 3,975,469, Cl. 261-87.000.

Fuhrmann, Siegfried, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Flexible conduit. 3,974,862, Cl. 138-37.000.

Fuji Photo Film Co., Ltd.: *See*—
Ohi, Reiichi; and Shishido, Tadao, 3,975,395.
Yamashita, Hiroshi; and Sakasai, Yutaka, 3,975,199.

Fujii, Shozo; and Inukai, Kan, to Agency of Industrial Science & Technology. Method for manufacture of tetrafluoroterephthalonitrile. 3,975,424, Cl. 260-465.00G.

Fujimoto, Masato: *See*—
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, 3,974,794.

Fujimura, Masanori: *See*—
Matsuo, Yoshihiro; Fujimura, Masanori; Matsuoka, Tomizo; and Hayakawa, Shigeru, 3,975,307.

Fujisaki, Yoshinori; Matsuda, Yoshio; and Tsubokawa, Yoshitoki, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener stringer. 3,974,550, Cl. 24-205.10C.

Fujishige, Shoei; and Suzuki, Mitsuo, to Agency of Industrial Science & Technology. Method for manufacture of polymer having different stereospecific structures at desired ratio from vinyl monomers. 3,975,328, Cl. 260-63.00R.

Fujita, Yoshiji; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Diols and process for preparation thereof. 3,975,451, Cl. 260-635.00Y.

Fukama, Toshio: *See*—
Okada, Reisuke; Okuno, Hiroshi; and Fukama, Toshio, 3,975,484.

Fukuda, Yoshiharu; and Ueda, Yoshihiko, to Onoda Cement Company, Ltd. Apparatus for calcining cement. 3,975,148, Cl. 432-106.000.

Fuller, Alvin Walter, to Harvey Hubbell Incorporated. Standing box for electrial fixtures. 3,975,074, Cl. 339-89.00R.

Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide. 3,975,505, Cl. 423-478.000.

Funaishi, Kohtaro: *See*—
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,975,366.

Furnier-Und Sperrholzwerk J. F. Werz, Jr. KG Werzalit-Pressholzwerk: *See*—
Munk, Edmund; and Haas, Herbert, 3,975,127.

G. D. Searle & Co.: *See*—
Mazur, Robert H., 3,975,365.
Schwartz, Alan Asher, 3,975,344.

Gabbard, Henry: *See*—
Paulson, William T.; Davidson, David M., deceased; Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., 3,975,559.

Gabellieri, Rodolfo; and Raganato, Carlo, to Solvay & Cie. Apparatus for the recovery of fibrils made of synthetic polymer. 3,975,163, Cl. 23-272.60R.

Gainer, John L., to University of Virginia. Method for increasing the oxygen partial pressure in the bloodstream of mammals. 3,975,519, Cl. 424-180.000.

Gakhar, Ved P., to General Electric Company. Washing machine with improved additive dispensing means. 3,974,667, Cl. 68-17.00R.

Galich, Thomas Patrick, to Professional Amateur Industries, Inc. Tennis racket. 3,975,017, Cl. 273-73.00H.

Ganellin, Charon Robin: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,975,530.

Ganguly, Ashit K.; and Sarre, Olga, to Schering Corporation. Preparation of 12,13-desepoxy-12,13-dehydrorosamicin. 3,975,372, Cl. 536-17.000.

Gante, Joachim; Mehrhof, Werner; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Sulfur-containing ring compounds. 3,975,403, Cl. 260-327.00P.

Garretson Equipment Co., Inc.: *See*—
Garretson, Keith H., 3,974,851.

Garretson, Keith H., to Garretson Equipment Co., Inc. Demand type governors. 3,974,851, Cl. 137-494.000.

Garrett Corporation, The: *See*—
Burgess, Glenn A.; and Taylor, Paul J., 3,974,752.

Garrison, Gary D.: *See*—
Lewis, George D.; and Garrison, Gary D., 3,974,647.

Gasiunas, Donatas V.: *See*—
Mader, Arthur H.; Gasiunas, Donatas V.; and Stark, Edward W., 3,975,727.

Gast, Uwe: *See*—
Taudt, Heinz; and Gast, Uwe, 3,975,761.

Gates, Edward Jack, to Reynolds Metals Company. Cathode baking system. 3,975,144, Cl. 432-5.000.

Gautreaux, Gloria A.: *See*—
Harper, Robert J., Jr.; Bruno, Joseph S.; Blanchard, Eugene J.; and Gautreaux, Gloria A., 3,975,152.
Harper, Robert J., Jr.; Gautreaux, Gloria A.; and Bruno, Joseph S., 3,975,154.

Gebauer, Hans-Jurgen: *See*—
Mayer, Hans Rolf Jakob; Langecker, Gerhard; and Gebauer, Hans-Jurgen, 3,975,452.

Geiger, Willard L., to Erico Rail Products Company. Railroad motion detecting and signalling system with repeater receiver. 3,974,991, Cl. 246-34.0CT.

Geizer, Alfred Albertovich; and Chakhlov, Vladimir Lukyanovich. Betatron including electromagnet structure and energizing circuit therefor. 3,975,689, Cl. 328-237.000.

General Craft Supplies: *See*—
Violet, John L., 3,974,996.

General Electric Company: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 3,975,213.
Bean, Charles P.; and Giaever, Ivar, 3,975,238.
Chen, David Y.; and Fitzmayer, Louis H., 3,975,720.
Fessler, William A., 3,975,345.
Fitzmayer, Louis H., 3,974,696.
Gakhar, Ved P., 3,974,667.
Hancock, Charles C., 3,975,677.
Stoner, Jesse A., 3,974,873.

General Filters, Inc.: *See*—
Engel, Lewis O., 3,975,470.

General Foods Corporation: *See*—
D'Ercole, Augustine D., 3,975,547.
Fioriti, Joseph Anthony; and Mancuso, John Joseph, 3,975,550.

General Instrument Corporation: *See*—
Whelan, Robert D., 3,975,601.

General Motors Corporation: *See*—
Akeel, A. Hadi K.; Gmurowski, Romuald; and Wasserbaech, Eberhard E., 3,975,030.
Ferdelman, Donald C.; and Loos, John H., 3,974,661.
Mitchell, Harry R.; Rice, Hal H.; and Abel, James R., 3,974,650.

General Signal Corporation: *See*—
Toth, Maria; and Browne, Frank L., 3,974,933.

Genio Tools, Inc.: *See*—
Bennett, Gene Lee, 3,975,031.

Genisco Technology Corporation: *See*—
Jacques, James O.; Kockler, Barry C.; and Weller, Frank M., Jr., 3,975,768.

Gent, Colin William, to Imperial Chemical Industries Limited. Process for producing a natural gas substitute. 3,975,169, Cl. 48-214.00A.

Gent, John Arthur Gooch: *See*—
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,975,318.
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,975,319.

Gentry, Pat. Pleat measuring and forming device. 3,974,946, Cl. 223-34.000.

Georg Fischer Aktiengesellschaft: *See*—
Wuchner, Xaver, 3,974,562.

Georg Spiess GmbH: *See*—
Marass, Josef, 3,975,011.

Georgel, Jean; and Vilain, Maurice, to Thomson-CSF. Semi-automatic weapon-loading system. 3,974,737, Cl. 89-1.802.

Georgoudis, Paul C.; Schoenberg, Jules E.; Ray-Chaudhuri, Dilip K.; and Puletti, Paul P., to National Starch and Chemical Corporation. Copolyesters, method of manufacturing same, and hot melt adhesive compositions incorporating same. 3,975,323, Cl. 260-22.00D.

Gerdes, Theodor, to Blau KG Fabrik fur Kraftfahrzeugteile. Closure cap. 3,974,936, Cl. 220-204.000.

Gerhart, James E.: *See—*
Schisselbauer, John C.; Dobson, John J.; and Gerhart, James E., 3,975,010.

Gerking, Lueder: *See—*
Ruzek, Ivo; Worf, Guenther; Hartmann, Ludwig; Maahs, Paul; and Gerking, Lueder, 3,975,224.

Gerstner, Gerhard: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard, and Antemann, Joachim, 3,975,562.

Gertsch AG: *See—*
Lill, Viktor; Rossler, Ernst; Svoboda, Josef; and Weigl, Erwin, 3,975,033.
Weigl, Erwin; Rossler, Ernst; and Svoboda, Josef, 3,975,034.

Getsch, Edward W., to Pako Corporation. Slide cassette packer. 3,974,626, Cl. 53-244.000.

Gewerkschaft Victor Chemische Fabrik: *See—*
Hecht, Horstmar; Laue, Wolfgang; and Kirchgebner, Manfred, 3,975,513.

Geyer, Wolfgang G., to Rohm and Haas Company. Quantitative method for detecting 3-isothiazolones. 3,975,155, Cl. 23-230.00R.

Giaever, Ivar: *See—*
Bean, Charles P.; and Giaever, Ivar, 3,975,238.

Gidlund, Lennart Erik Idoft, to Atlas Copco Aktiebolag. Power wrench with magnetic sleeves for variable torque output. 3,974,884, Cl. 173-12.000.

Giertz, Hubert: *See—*
Reicheneder, Franz; Kropp, Rudolf; Amann, August; Giertz, Hubert; and Schuster, Joerg, 3,975,526.

Gifford-Hill & Company, Inc.: *See—*
Indresaeter, Harald, 3,974,845.

Gilbert, L. Eldean: *See—*
Paulson, William T.; Davidson, David M., deceased; Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., 3,975,559.

Gilbert, Philip Alan: *See—*
Davies, James Francis; Gilbert, Philip Alan; and Thompson, Laurence, 3,975,312.

Gildemeister Aktiengesellschaft: *See—*
Schalles, Erhard; Latten, Werner; and Stender, Reinhard, 3,974,721.
Wittkamp, Theodor, 3,974,705.

Gilomen, Beat; and Schaller, Kurt, to A. Schild S.A. Driving device for mechanical timepiece movements. 3,974,639, Cl. 58-86.000.

Giordano, Jean Louis; and Guettier, Michel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Device for limiting brake pressure according to vehicle load and deceleration. 3,975,062, Cl. 303-22.00R.

Gish, Duane T.; Gray, Gary D.; and Wechter, William J., to Upjohn Company, The. Arabinofuranosyl N^4-aminoacyl cytosine containing compounds. 3,975,367, Cl. 260-112.50R.

Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and by Ruga, Viktor Astievich, administrator. Installation for producing glassceramic tiles. 3,975,130, Cl. 425-404.000.

Giuliani, David J.: *See—*
Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., 3,975,648.

Givaudan Corporation: *See—*
Helminger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,975,311.
Nikawitz, Edward J., 3,975,435.

Gizard, Pierre; and Boyer, Jean, to Becton, Dickinson and Company. Stopper for specimen container. 3,974,930, Cl. 215-247.000.

Glass, Alastair Malcolm; and von der Linde, Dietrich, to Bell Telephone Laboratories, Incorporated. Photovoltaic generation and device. 3,975,632, Cl. 250-212.000.

Glastetter, Manfred: *See—*
Mahotka, Hans; and Glastetter, Manfred, 3,975,063.

Glaxo Laboratories Limited: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,975,376.

Glenn, John P., to Raymond Lee Organization, Inc., The, a part interest. Ski boot scraper. 3,975,036, Cl. 280-11.37E.

Glenn, Robert: *See—*
Barouh, Victor; and Glenn, Robert, 3,974,539.

Globe Tool and Engineering Company, The: *See—*
Reiger, Arthur C., Jr.; and Finegold, Hyman B., 3,974,553.

Gmurowski, Romuald: *See—*
Akeel, A. Hadi K.; Gmurowski, Romuald; and Wasserbaech, Eberhard E., 3,975,030.

Godmaire, Roland A. Piston for compressor. 3,974,745, Cl. 92-127.000.

Godsen, Ronald A.: *See—*
Kraatz, Gerald A.; Godsen, Ronald A.; Gunner, Herbert M., Jr.; and Tranquilla, Michael N., 3,974,787.

Godwin, Gurney L.: *See—*
Kilgore, Lee A.; Godwin, Gurney L.; and Whitney, Eugene C., 3,975,646.

Goetzman, Harold E., to United States Steel Corporation. Pellets useful in shaft furnace direct reduction and method of making same. 3,975,182, Cl. 75-3.000.

Goffe, William L., to Xerox Corporation. Migration imaging system. 3,975,195, Cl. 96-1.0PS.

Goffe, William L., to Xerox Corporation. Migration imaging system using shaped electrode. 3,975,739, Cl. 346-74.0ES.

Goi, Hitoshi: *See—*
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.

Gonda, Michihiro: *See—*
Ohnishi, Yoshitake; Ozutsumi, Minoru; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,975,285.

Goodfellow, Kenneth A., to Du Pont de Nemours, E. I., and Company. Inflatable lighter-than-air article composed of a coated triaxial weave construction. 3,974,989, Cl. 244-126.000.

Goodnight, Lyman E., Jr.: *See—*
Bohl, Thomas L.; Goodnight, Lyman E., Jr.; Ruble, Herschel C.; and Wells, John H., 3,975,160.

Goodyear Tire & Rubber Company, The: *See—*
Barnewall, James M.; and Scheibelhoffer, Anthony S., 3,975,329.
Kline, Richard H., 3,975,360.
Kline, Richard H., 3,975,414.
Lal, Joginder; and Sandstrom, Paul H., 3,975,336.
Moline, Donald F., 3,975,297.
Watts, George T., 3,974,870.
Wideman, Lawson G., 3,975,392.

Goos, Heinz; and Rose, Peter, to Heidenreich & Harbeck ZWeigniederlassung der Gildemeister AG. Method and apparatus for heating synthetic plastic components. 3,975,618, Cl. 219-388.000.

Gorbaty, Martin L., to Exxon Research and Engineering Company. Process for gasifying carbonaceous solids and removing toxic constituents from aqueous effluents. 3,975,168, Cl. 48-197.00R.

Gordon, Joseph; and Sukornick, Bernard, to Allied Chemical Corporation. Formation of a fluorine compound and the compound. 3,975,501, Cl. 423-351.000.

Gordon, Pat LeMar, to Bell Telephone Laboratories, Incorporated. Dither threshold generators. 3,975,584, Cl. 178-6.000.

Gordon, Stanley H., to TRW Inc. Trim fastening. 3,975,611, Cl. 219-98.000.

Gorman, Lee V., to Chemprobe Corporation. Molecular composite structures. 3,975,248, Cl. 204-157.10S.

Gorog, Sandor: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,975,390.

Goser, Karl, to Siemens Aktiengesellschaft. Semiconductor arrangement, particularly a storage arrangement with field effect transistors, and method of operating the same. 3,975,718, Cl. 340-173.00R.

Goto, Kenji; Hashiguchi, Yukihide; and Shibata, Norio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air flow direction control valves. 3,974,861, Cl. 137-627.500.

Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, to Montedison S.p.A. Crystalline adducts of carbamoyl sulphoxides and urea in a 1:3 ratio. 3,975,180, Cl. 71-103.000.

Grabowski, Rene: *See—*
Bertrand, Raymond; Tenaud, Jean; and Grabowski, Rene, 3,974,970.

Granger, Nina Kathryn, executrix: *See—*
Granger, Wallace H., deceased; and Granger, Nina Kathryn, executrix, 3,974,710.

Granger, Wallace H., deceased; and by Granger, Nina Kathryn, executrix. Gear drive for rotary press and the like. 3,974,710, Cl. 74-465.000.

Grant, Robert: *See—*
Burneil, Anthony John; and Grant, Robert, 3,974,792.

Graser, Earl J., to Olinkraft, Inc. Carrier with drop down partition. 3,974,911, Cl. 206-141.000.

Gravelle, Homer E., to Sundstrand Corporation. Adjustable bearing assembly. 3,975,065, Cl. 308-73.000.

Graves, Ross E.; and Stokes, Lyle S., to Hughes Aircraft Company. Optical heterodyne receiver with phase or frequency lock. 3,975,628, Cl. 250-199.000.

Gray, Gary D.: *See—*
Gish, Duane T.; Gray, Gary D.; and Wechter, William J., 3,975,367.

Gray, Peter Harrison; Row, Grant David; and Stinson, John David, to Du Pont of Canada Limited. Pouched oil dispenser. 3,974,942, Cl. 222-83.500.

Grearson, Kenneth R., to Multuloc Corporation. Panel wall construction. 3,974,608, Cl. 52-235.000.

Grebe, Klaus; de Haas, Hans; Dautzenberg, Norbert; and Hewing, Josef, to Mannesmann Aktiengesellschaft. Method of making iron powder. 3,975,186, Cl. 75-.5AA.

Green, Dale; Erway, Duane; Condon, Robert; Schoonover, William C.; and Rowe, Norman L., to United States of America, Air Force. Multispectral laser camera device. 3,975,748, Cl. 358-78.000.

Green, David; Nathanson, Harvey C.; and Malmberg, Paul R., to Westinghouse Electric Corporation. Random-access spoken word electron beam digitally addressable memory. 3,975,598, Cl. 179-100.10B.

Greenberg, Jacob, to Anti-Pollution Systems, Inc. Solid-liquid waste incinerator utilizing liquid catalysts. 3,974,784, Cl. 110-8.00R.

Greenewald, Herbert, Jr. Indirect arc metal melting furnace method. 3,975,578, Cl. 13-34.000.

Greenstein, Bernard, to Owens-Illinois, Inc. Vehicle and printing pastes for use in the manufacture of microelectronic packages. 3,975,201, Cl. 106-48.000.

Greenwald, Richard B.: *See—*
Borror, Alan L.; and Greenwald, Richard B., 3,975,423.

Gregory, Gordon Ian: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,975,376.

Greiner, Peter: *See—*
Hontschik, Heinrich; Schmid, Ingobert; and Greiner, Peter, 3,975,037.

Grek, Ronald: *See—*
Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, 3,975,685.

Grendelmeier, Georg: *See—*
Bory, Michael; and Grendelmeier, Georg, 3,975,667.

Griffiths, Norman David. Method and means of generating electrical energy. 3,975,651, Cl. 310-11.000.

Griffon, Henri. Deproteination of yeast cells. 3,975,553, Cl. 426-656.000.

Grobman, William, to Molins Machine Company, Inc. Dual ink circulation and wash-up system for a press. 3,974,768, Cl. 101-425.000.

Groschopp, Hans, to Pfaff Industriemaschinen GmbH. Apparatus for inserting objects into cartons. 3,974,627, Cl. 53-261.000.

Grosh, James L., to Indian Head Inc. Underground reinforced plastic enclosure. 3,974,599, Cl. 52-20.000.

Gross, Anthony E.; and Connelly, Larry J., to Nalco Chemical Company. Use of alkali metal silicates to reduce particulate emissions in sintering operations. 3,975,183, Cl. 75-3.000.

Gross, Anthony E., to Nalco Chemical Company. Particulate emissions reduction in sintering operations. 3,975,185, Cl. 75-5.000.

Gross, Stanley Joseph, to Biological Developments, Inc. Tyrosyl-class antigenic conjugates, their preparation and antibodies raised thereto. 3,975,342, Cl. 260-112.00R.

Grumman Aerospace Corporation: *See—*
Latham, Roy W.; and Schultz, Albert N., Jr., 3,975,731.
Nelson, George R., Jr.; and Kaplan, Herman, 3,974,879.

Grunberg, Claude; and Le Devehat, Jean, to Commissariat a l'Energie Atomique. Method and device for localization of ionizing particles. 3,975,638, Cl. 250-385.000.

Grunewald, Eberhard L.: *See—*
Holl, Ludwig; Winkler, Adalbert; and Grunewald, Eberhard L., 3,975,665.

GTE Laboratories Incorporated: *See—*
Norman, Scott L., 3,975,080.

GTE Sylvania Incorporated: *See—*
Brenan, Robert R.; and Johnson, Gordon L., 3,974,954.

Guanzini, Aldo, to Nauterra S.A. Boat hull with spherical dome. 3,974,535, Cl. 9-1.300.

Guettier, Michel: *See—*
Giordano, Jean Louis; and Guettier, Michel, 3,975,062.

Guidry, Joseph L. Backing disc with means to expel abraded particles. 3,974,598, Cl. 51-358.000.

Gunner, Herbert M., Jr.: *See—*
Kraatz, Gerald A.; Godsen, Ronald A.; Gunner, Herbert M., Jr.; and Tranquilla, Michael N., 3,974,787.

Guntersdorfer, Siegfried, to Siemens Aktiengesellschaft. Apparatus utilizing a phantom circuit for connecting additional subscribers to a telecommunication system. 3,975,594, Cl. 179-15.0BB.

Guthlein, Werner: *See—*
Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,975,398.

Haarmann, Walter: *See—*
Narr, Berthold; Roch, Josef; Muller, Erich; and Haarmann, Walter, 3,975,384.
Nickl, Josef; Muller, Erich; Schroter, Wolfgang; Haarmann, Walter; and Roch, Josef, 3,975,524.

Haarstick Sailmakers Chesapeake, Inc.: *See—*
Haarstick, Stephen H.; and Lynch, John W., 3,974,791.

Haarstick, Stephen H.; and Lynch, John W., to Haarstick Sailmakers Chesapeake, Inc. Sails and method of manufacture. 3,974,791, Cl. 114-103.000.

Haas, Herbert: *See—*
Munk, Edmund; and Haas, Herbert, 3,975,127.

Haber, Terry M. Hourglass watch. 3,974,638, Cl. 58-50.00R.

Habermeier, Juergen; and Porret, Daniel, to Ciba-Geigy Corporation. Heterocyclic triglycidyl compounds and process. 3,975,397, Cl. 260-309.500.

Habiger, Cyril W., to Caterpillar Tractor Co. Null and gain adjustment mechanism for hydrostatic pumps and motors. 3,974,715, Cl. 74-571.00R.

Hachmann, Klaus; Jakobi, Gunther; Weber, Rudolf; Boeck, Alexander; and Jung, Dieter, to Henkel & Cie G.m.b.H. Storage-stable, readily-soluble detergent additives, coating compositions and process. 3,975,280, Cl. 252-102.000.

Hackbarth, Eugene R.; and Ward, Harry M., III, to Outboard Marine Corporation. Rotary internal combustion engine. 3,975,122, Cl. 418-83.000.

Hagelberg, A. Torvald Sverker, to Bengt Petersson New Products Investment AB. Printing method and apparatus. 3,974,767, Cl. 101-151.000.

Hagemeyer, Hugh J., Jr.: *See—*
Palmer, Billy W.; Bondurant, David L.; and Hagemeyer, Hugh J., Jr., 3,975,450.

Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 3,975,440, Cl. 260-586.00C.

Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. 2-Alkyl-2-(3-oxoalkyl)-1,3-cyclopentadiones. 3,975,442, Cl. 260-586.00R.

Hakim, Mehmood Abdulhameed; and Bysouth, Peter Thomas, to BDH Pharmaceuticals Limited. Pyridazinones. 3,975,388, Cl. 260-250.00A.

Hallgreen, Knud Julius; and Iversen, Poul Christian Carlos, to Danfoss A/S. Control system for charging and discharging an electric storage heater. 3,975,620, Cl. 219-364.000.

Halperin, Abraham. Restraining device for dogs and other animals. 3,974,800, Cl. 119-106.000.

Halpern, Richard L.; and Skiles, Carl L. Water gate. 3,974,655, Cl. 61-30.000.

Halstead, William S., to Carrier Communications, Inc. Radio-frequency signaling cable for inductive-carrier communications systems. 3,975,700, Cl. 333-84.00L.

Hambrick, Lester N.; and Flowers, Carl C. Rail base grinding method. 3,974,597, Cl. 51-281.00R.

Hamill, Thomas E., to Coulter Diagnostics, Inc. Monophosphate salt of o-cresolphthalein. 3,975,405, Cl. 260-343.400.

Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,975,523.

Hammecke, Michael, to Eltra KG Leicht & Trambauer. Railway track switch heating arrangement. 3,974,993, Cl. 246-428.000.

Hammond, Robert J., to V-M Corporation. No-back control for a permanent magnet rotor motor. 3,975,652, Cl. 310-41.000.

Hancock, Charles C., to General Electric Company. Method and apparatus for testing an inductive device for the presence of a voltage suppressor. 3,975,677, Cl. 324-28.000.

Hapgood, William H., to Raytheon Company. Burner control system. 3,975,137, Cl. 431-79.000.

Hardies, Charles E., to Westinghouse Electric Corporation. Multiple time difference ultrasonic flowmeter. 3,974,693, Cl. 73-194.00A.

Hardtmann, Goetz E., to Sandoz, Inc. N-substituted-3-azaisatoic anhydrides. 3,975,386, Cl. 260-244.00A.

Hardwick, Steven Finn: *See—*
Toth, Tibor Endre; and Hardwick, Steven Finn, 3,975,614.

Hardy, Raymond: *See—*
Roeder, George K.; and Hardy, Raymond, 3,974,878.

Hardy, Thomas G., Jr. Anastomotic apparatus and method. 3,974,835, Cl. 128-334.00C.

Harmon, Paul E.: *See—*
Erdody, Robert G.; Harmon, Paul E.; and Tetro, Richard S., 3,974,723.

Haroules, George G.: *See—*
Ewen, Harold I.; and Haroules, George G., 3,975,736.

Harper, Norman James; and Veitch, George Bryan Austin, to Allen & Hanburys Limited. 1-(3,4-dichlorobenzamidomethyl)-cyclohexyldimethylamine. 3,975,443, Cl. 260-558.00D.

Harper, Robert J., Jr.; Bruno, Joseph S., Blanchard, Eugene J.; and Gautreaux, Gloria A., to United States of America, Agriculture. Simultaneous dyeing and crosslinking of cellulosic fabrics. 3,975,152, Cl. 8-17.000.

Harper, Robert J., Jr.; Gautreaux, Gloria A.; and Bruno, Joseph S., to United States of America, Agriculture. Process for producing and utilizing durable press fabrics with strong acid grafts. 3,975,154, Cl. 8-116.00P.

Harris Corporation: *See—*
Nicolay, Hugh Crawford, 3,975,752.

Hartford Special Machinery Company, The: *See—*
Morton, Robert D., 3,974,904.

Hartman, Richard L., to United States of America, Army. Waveguide beyond cutoff coupler for coupling to resonant cavity. 3,975,695, Cl. 333-24.00R.

Hartmann, Ludwig: *See—*
Ruzek, Ivo; Worf, Guenther; Hartmann, Ludwig; Maahs, Paul; and Gerking, Lueder, 3,975,224.

Harvey, Francis J., II; and Fey, Maurice G., to Westinghouse Electric Corporation. Arc heater reduction of zinc roast. 3,975,188, Cl. 75-14.000.

Harvey Hubbell Incorporated: *See—*
Fuller, Alvin Walter, 3,975,074.

Hashiguchi, Yukihide: *See—*
Goto, Kenji; Hashiguchi, Yukihide; and Shibata, Norio, 3,974,861.

Hashimoto, Hiromi: *See—*
Tan, Yoichi; and Hashimoto, Hiromi, 3,975,687.

Hashimoto, Koji: *See—*
Shida, Sankichi; Hashimoto, Koji; Hirohata, Hyogo; and Honjo, Katsuhiko, 3,975,076.

Hassler, Dieter, to Siemens Aktiengesellschaft. Apparatus for the measurement of the velocity of media flowing in conduits. 3,974,692, Cl. 73-194.00A.

Hasue, Tatsuo: *See—*
Tsubota, Katsuya; Motani, Shigeru; Hasue, Tatsuo; and Nijima, Yasuhiro, 3,975,338.

Hatagawa, Toyotsugu: *See—*
Tanaka, Junzo; Matsushima, Haruo; and Hatagawa, Toyotsugu, 3,975,606.

Haugen, Leif R., to Falconbridge Nickel Mines Limited. Recovery of copper sulphide and nickel from solution. 3,975,189, Cl. 75-101.00R.

Hauni-Werke Korber & Co., KG: *See*—
Frank, Willi, 3,974,750.
Wochnowski, Waldemar; Leckband, Uwe; Barth, Hans-Heinrich; and Hohm, Reinhard, 3,974,839.

Haupin, Warren E.; and Luffy, John W., to Aluminum Company of America. Thermocouple protective composite tube. 3,975,212, Cl. 136-232.000.

Hauschild, Ulrich; Musall, Reimar; and Schroder, Hans-Jurgen, to Kali-Chemie Aktiengesellschaft. Method for producing alkali carbonate. 3,975,503, Cl. 423-421.000.

Hawkins, Donald W.: *See*—
Ebner, Theran L.; and Hawkins, Donald W., 3,975,589.

Hawkins, James B.: *See*—
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,974,763.

Hayakawa, Shigeru: *See*—
Matsuo, Yoshihiro; Fujimura, Masanori; Matsuoka, Tomizo; and Hayakawa, Shigeru, 3,975,307.

Hayashi, Masahiro: *See*—
Yamawaki, Takeshi; Hayashi, Masahiro; and Endo, Kazuo, 3,975,461.

Hayashi, Yoshimasa: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-Ichi, 3,974,651.

Haynes, George R.: *See*—
Kodama, Jiro K.; Haynes, George R.; and Albert, James R., 3,975,533.

Heap, Gordon: *See*—
Stead, Michael; and Heap, Gordon, 3,974,860.

Hecht, Horstmar; Laue, Wolfgang; and Kirchgebner, Manfred, to Gewerkschaft Victor Chemische Fabrik. Sustained-release tablet for prophylaxis against trace element deficiency diseases. 3,975,513, Cl. 424-19.000.

Hedger, John Henry. Engines, or prime movers. 3,974,744, Cl. 91-454.000.

Heds, Inc.: *See*—
Johnson, Theodore C.; and Snodgrass, James D., 3,975,256.

Hehl, Karl. Device for monitoring and adjusting the temperature of multiple cooling circuits. 3,974,857, Cl. 137-559.000.

Heiberger, Charles A., to Air Products and Chemicals, Inc. Sound reproduction compositions. 3,975,321, Cl. 260-18.0PF.

Heidenreich & Harbeck ZWeingniederlassung der Gildemeister AG: *See*—
Goos, Heinz; and Rose, Peter, 3,975,618.

Heitert, John S., to Ford Motor Company. Air intake duct assembly. 3,974,808, Cl. 123-122.00D.

Helbers, Jan Hendrik, to Sycor, Inc. Method and apparatus for loading flexible magnetic recording discs to transducing heads. 3,975,774, Cl. 360-130.000.

Held, Hans. Starting device for a rocket aircraft for playing or learning purposes. 3,974,819, Cl. 124-17.000.

Helminger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, to Givaudan Corporation. 3,7-Dimethyl-octa-2,6 dienyl-mercaptan perfume composition. 3,975,311, Cl. 252-522.000.

Helt, Wilson G.: *See*—
Newton, John W.; and Helt, Wilson G., 3,975,656.

Henderson, Robert M.; Zechlin, Richard; and Reddy, K. Narasimha, to Colt Industries Operating Corporation. Electronic ignition system with combined output from multiple coils. 3,974,816, Cl. 123-148.0CC.

Henderson, Robert M.; and Zechlin, Richard, to Colt Industries Operating Corporation. Breakerless ignition control system. 3,974,817, Cl. 123-149.00C.

Hendry, Allen J.; and Maier, Alfred E., to Westinghouse Electric Corporation. Circuit breaker with one-way adjustment of tripping current level. 3,975,701, Cl. 335-176.000.

Henkel & Cie G.m.b.H.: *See*—
Hachmann, Klaus; Jakobi, Gunther; Weber, Rudolf; Boeck, Alexander; and Jung, Dieter, 3,975,280.

Henkel, Egon; and Wildforster, Heinrich, to Bergwerksverband GmbH. Method and arrangement for equalizing the speeds of a plurality of asynchronous motors jointly driving a single machine, particularly a mining machine. 3,974,716, Cl. 74-661.000.

Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Cyclopropanemethyl esters of cinnamic acid and derivatives thereof. 3,975,429, Cl. 260-473.00R.

Hensarling, Thomas P.: *See*—
Jacks, Thomas J.; Barker, Robert H.; and Hensarling, Thomas P., 3,975,343.

Henze, Herbert O., to Penn Fishing Tackle Mfg. Co. Anti-reverse mechanism for fishing reels. 3,974,978, Cl. 242-84.10R.

Henze, Walter J.; and Thein, San, to Penn Fishing Tackle Mfg. Co. Fishing line retention device. 3,974,589, Cl. 43-43.120.

Hepworth, Edward C.; Means, Rodney J.; and Peddle, Charles I., to Motorola, Inc. Asynchronous communication interface adaptor. 3,975,712, Cl. 340-147.00R.

Herbst, Clarence A., Sr., to Resinoid Engineering Corporation. High speed chopper for precision mixers. 3,974,969, Cl. 241-98.000.

Herbst, John F. Mill hydraulic screw-down. 3,974,672, Cl. 72-21.000.

Herd, David P.; and Fowler, John H., to McEvoy Oilfield Equipment Co. Underwater well completion method and apparatus. 3,974,875, Cl. 166-.500.

Herlan, Alton G., to Pivot Punch Corporation. Multi-part punch. 3,974,728, Cl. 83-686.000.

Hermann Stribel KG: *See*—
Franz, Albert, 3,975,721.

Hertz, Walter; and Stroh, Jan, to Siemens Aktiengesellschaft. Arc quenching arrangement for a gas flow circuit breaker. 3,975,602, Cl. 200-148.00A.

Hess, Ernst Peter: *See*—
Lee, Sen Lin; and Hess, Ernst Peter, 3,974,906.

Hettinger, William P., Jr. Methods of treating cellular tissue. 3,975,516, Cl. 424-81.000.

Hettinger, William P., Jr.: *See*—
Braithwaite, David G.; and Hettinger, William P., Jr., 3,975,283.

Hewing, Josef: *See*—
Grebe, Klaus; de Haas, Hans; Dautzenberg, Norbert; and Hewing, Josef, 3,975,186.

Hewlett-Packard Company: *See*—
Mordan, William J., 3,975,684.
Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., 3,975,648.

Higashida, Susumu: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Hill, David T.; and Loev, Bernard, to Smith Kline. Pharmaceutical compositions and methods of producing coronary vasodilation. 3,975,537, Cl. 424-285.000.

Hill, Robert R.; and Beemer, Robert J., to Lee Wilson Engineering Company, Inc. Open coil heat shielding. 3,975,145, Cl. 432-10.000.

Hill, William J., to Morgan Construction Company. Coil compactor. 3,974,761, Cl. 100-7.000.

Himmelberger, Lynn: *See*—
Van Vliet, Edward; Fendler, George W.; and Himmelberger, Lynn, 3,974,574.

Himmele, Walter; Hofmann, Ernst; Hoffmann, Herwig; and Plass, Reinhold, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Method of continuously producing γ-butyrolactams. 3,975,400, Cl. 260-326.5FN.

Himmelweit, Fred: *See*—
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,975,520.

Hinners, William L.: *See*—
Daily, Thomas E.; Stanford, Charles O.; and Hinners, William L., 3,974,573.

Hirabayashi, Syoji: *See*—
Kawakami, Takeshi; Tani, Tsutomu; Ishikawa, Takatoshi; and Hirabayashi, Syoji, 3,975,653.

Hirabayashi, Yoichi: *See*—
Minoura, Kazuo; and Hirabayashi, Yoichi, 3,975,095.

Hirai, Utaka: *See*—
Sameshima, Muneyasu; Osawa, Tagui; and Hirai, Utaka, 3,975,411.

Hirao, Takehiko: *See*—
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, 3,974,794.

Hirata, Sadao; Yamada, Muneki; and Kishimoto, Akira, to Toyo Seikan Kaisha Limited. Molded structures containing crystalling polyolefin saponified ethylene vinyl acetate copolymer and carbonyl containing copolymers. 3,975,463, Cl. 260-897.00B.

Hirayama, Itaru, to Nisshin Kogyo Kabushiki Kaisha. Fluid pressure control device with a failure alarm for a vehicle brake system. 3,975,060, Cl. 303-6.00C.

Hirohata, Hyogo: *See*—
Shida, Sankichi; Hashimoto, Koji; Hirohata, Hyogo; and Honjo, Katsuhiko, 3,975,076.

Hirsch, Richard F. Blind rivet magazine. 3,974,913, Cl. 206-344.000.

Hitachi Electronics Co., Ltd.: *See*—
Sato, Kazuhiro; Ishibashi, Shizuka; and Eto, Yoshizumi, 3,975,657.

Hitachi, Ltd.: *See*—
Kawagoe, Hiroto; and Nomiya, Kosei, 3,975,649.
Kawakami, Hideaki, 3,975,726.
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; Kawada, Yasuzi; and Okamura, Hisanori, 3,975,612.
Sato, Kazuhiro; Ishibashi, Shizuka; and Eto, Yoshizumi, 3,975,657.

Hitzman, Donald O., to Phillips Petroleum Company. Microbial production of dicarboxylic acids. 3,975,234, Cl. 195-28.00R.

Hobart Corporation: *See*—
Allen, Kenneth C.; and Rogers, Robert M., 3,974,887.

Hobbins, James F.: *See*—
Hurst, George H., Jr.; and Hobbins, James F., 3,974,711.

Hobeg Hochtemperaturreaktor-Brennelement GmbH: *See*—
Hrovat, Milan; and Rachor, Lothar, 3,975,471.

Hochberg, Frederick; and Reisman, Arnold, to International Business Machines Corporation. Method and apparatus for recording information on a recording surface through the use of mists. 3,974,769, Cl. 101-426.000.

Hodges, Kenneth M. Liquid additive dispenser. 3,974,847, Cl. 137-101.110.

Hodogaya Chemical Co., Ltd.: *See*—
Ohnishi, Yoshitake; Ozutsumi, Minoru; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,975,285.

Hoechst Aktiengesellschaft: *See*—
Saupe, Wolfram, 3,975,146.

Hofer, Kurt: *See*—
Avar, Lajos; and Hofer, Kurt, 3,975,382.

Hofer, Peter H.: *See—*
McLean, Robert F.; and Hofer, Peter H., 3,975,492.

Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-(2-Carbisopropoxyphenyl)-thionophosphoric (phosphonic) acid ester-amides and ester-imides and insecticidal and acaricidal composition and method. 3,975,523, Cl. 424-212.000.

Hoffmann, Herwig: *See—*
Himmele, Walter; Hofmann, Ernst; Hoffmann, Herwig; and Plass, Reinhold, 3,975,400.

Hoffmann-La Roche Inc.: *See—*
Hajos, Zoltan George; and Parrish, David Richard, 3,975,440.
Hajos, Zoltan George; and Parrish, David Richard, 3,975,442.
Kienzle, Frank; and Mayer, Hans Johann, 3,975,445.

Hofman, Oldrich: *See—*
Cervinka, Jaroslav; Hofman, Oldrich; and Husak, Pavel, 3,974,901.

Hofmann, Ernst: *See—*
Himmele, Walter; Hofmann, Ernst; Hoffmann, Herwig; and Plass, Reinhold, 3,975,400.

Hofmann, Heinrich; and Markfelder, Gunter, to Kugelfischer Georg Schafer & Co. Journal bearing. 3,975,066, Cl. 308-201.000.

Hofmann, Wilfried; Dietrich, Karl-Heinz; Rauffer, Walter; Schuhmeir, Eugen; and Kohler, Reinhard, to AGFA-Gevaert, A.G. Continuous microfilming camera. 3,975,749, Cl. 354-195.000.

Hohm, Reinhard: *See—*
Wochnowski, Waldemar; Leckband, Uwe; Barth, Hans-Heinrich; and Hohm, Reinhard, 3,974,839.

Hokao, Zenjiro: *See—*
Yasunaga, Yoshikazu; Hokao, Zenjiro; Sakusabe, Koji; and Tago, Yoshimitsu, 3,975,228.

Holbrook, Rex R.: *See—*
Martin, Frank J.; and Holbrook, Rex R., 3,975,609.

Holda, Eugene M.; and Lark, John C., to Standard Oil Company (Indiana). Woven polyester fabric treated with an aminoplast/water-soluble polyester resin composition. 3,975,566, Cl. 428-290.000.

Holl, Ludwig; Winkler, Adalbert; and Grunewald, Eberhard L., to Becker Flugfunkwerk. Wireless set having circuit plate bars arranged in a frame. 3,975,665, Cl. 317-101.0DH.

Holmes, Dennis K., to Double, Steve P., a part interest. Doubled-end cartridge tape. 3,974,975, Cl. 242-55.19A.

Holt, Lloyd J.; and Panlaqui, Clayton, to United States of America, Navy. Dual ejector stores attitude control system. 3,974,990, Cl. 244-137.00R.

Homeyer, Bernhard: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 3,975,523.

Honeywell Inc.: *See—*
Kelley, Thomas P., 3,975,742.
Peterson, Dean M., 3,975,077.

Honeywell Information Systems, Inc.: *See—*
Webb, Larry J., 3,975,680.

Honjo, Katsuhiko: *See—*
Shida, Sankichi; Hashimoto, Koji; Hirohata, Hyogo; and Honjo, Katsuhiko, 3,975,076.

Honmann, Winfried, to LTG Lufttechnische GmbH. Air outlet. 3,974,755, Cl. 98-40.00D.

Hontschik, Heinrich; Schmid, Ingobert; and Greiner, Peter. Automotive safety device. 3,975,037, Cl. 280-733.000.

Hooker Chemicals & Plastics Corporation: *See—*
Fuller, Willard A., 3,975,505.

Hope Kabushiki Kaisha: *See—*
Murata, Masahiro, 3,975,035.

Horacek, Heinrich: *See—*
Nintz, Eckhard; Schick, Rupert; Horacek, Heinrich; and Stahnecker, Erhard, 3,975,327.

Hordeski, Edward R.: *See—*
Luperti, Harry E.; Irvine, Robert; and Hordeski, Edward R., 3,974,749.

Horenkamp, Franz: *See—*
Lusch, Peter; and Horenkamp, Franz, 3,974,530.

Horiuchi, Hideo: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Horn, Robert; and Slovacek, Raymond J., to Forney Engineering Company. Programmable logic controller system. 3,975,622, Cl. 235-151.100.

Hornman, Johannes Petrus: *See—*
Van Esdonk, Johannes; Hornman, Johannes Petrus; Bluekens, Antonius Matheus Johanna; and Mattheij, Mathieu Martinus Maria Petrus, 3,974,583.

Horton, Anna M.: *See—*
Horton, Edward L., Jr.; and Horton, Anna M., 3,974,764.

Horton, Edward L., Jr.; and Horton, Anna M. Exhaust valve. 3,974,764, Cl. 100-269.00R.

Houdaille Industries, Inc.: *See—*
Frazierr, James L., 3,975,109.

Hough, John A., to Tullen Industries Limited. Surface hardened steel cutting blade. 3,974,564, Cl. 30-350.000.

Houston Natural Gas Corporation: *See—*
Ebner, Theran L.; and Hawkins, Donald W., 3,975,589.

Howell, Ian Valentine: *See—*
Crathorne, Elizabeth Anne; Howell, Ian Valentine; and Pitkethly, Robert Chalmers, 3,975,299.

Hritz, George G.: *See—*
Leach, Bruce E.; Hritz, George G.; and Royer, Dennis Jack, 3,975,510.
Royer, Dennis Jack; and Hritz, George G., 3,975,509.

Hrovat, Milan; and Rachor, Lothar, to Hobeg Hochtemperaturreaktor-Brennelement GmbH. Process for the production of fuel combined articles for addition in block shaped high temperature fuel elements. 3,975,471, Cl. 264-.500.

Hubbard, Clyde W., Jr.: *See—*
Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., 3,975,636.
Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., 3,975,705.

Hubbard, Elbert M.: *See—*
Melton, Rosser B., Jr.; and Hubbard, Elbert M., 3,974,939.

Huber, Harry J. Burglar-proof guard for light bulbs. 3,975,627, Cl. 240-102.00R.

Huboud-Peron, Jean, to Societe des Anciens Establissements L. Geismar; and Societe Turripinoise de Mecanique Stumec. Machine tool for cutting-off rails. 3,974,596, Cl. 51-178.000.

Hudgin, Donald Edward; and Blair, Edgar Allan, to Princeton Polymer Laboratories, Incorporated. Hydrophilic or hydrogel carrier systems such as coatings, body implants and other articles. 3,975,350, Cl. 260-30.40N.

Hughes Aircraft Company: *See—*
Graves, Ross E.; and Stokes, Lyle S., 3,975,628.
O'Meara, Thomas R., 3,975,629.

Hulse, Murlin L. Apparatus for removing particles and chemicals from a fluid solution. 3,975,257, Cl. 204-299.00R.

Hunter, James H.; and Skulnick, Harvey I., to Upjohn Company, The. Process for preparing 2-thiouracil nucleosides. 3,975,374, Cl. 536-23.000.

Hunter, William, to Brookside Metal Company Limited. Electrolytic refining. 3,975,244, Cl. 204-108.000.

Huppmann, Winfried J.: *See—*
Kunda, Wasyl; and Huppmann, Winfried J., 3,975,217.

Hurd, Stanley E., to Motch & Merryweather Machinery Company, The. Stopping device for air conveyor. 3,975,057, Cl. 302-31.000.

Hurst, George H., Jr.; and Hobbins, James F., to Hurst Performance, Inc. Stick shift assembly. 3,974,711, Cl. 74-473.00R.

Hurst Performance, Inc.: *See—*
Hurst, George H., Jr.; and Hobbins, James F., 3,974,711.

Hurst, Thomas L.: *See—*
Lotzgesell, James A.; Moser, Kenneth B.; and Hurst, Thomas L., 3,975,206.

Hurt, William S., to Rohm and Haas Company. O,S-dialkyl O-sulfonyloxy-phenyl phosphorothiolates and phosphorodithioates. 3,975,420, Cl. 260-456.00P.

Husak, Pavel: *See—*
Cervinka, Jaroslav; Hofman, Oldrich; and Husak, Pavel, 3,974,901.

Hutner, Mark A., to Xerox Corporation. Scanning and selection methods and apparatus therefor. 3,975,715, Cl. 340-172.500.

Hutson, Jearld L. Apparatus for applying a film of material to substrates or slices. 3,974,797, Cl. 118-54.000.

Hydrodyne Development Company: *See—*
Fisher, Lewis M.; and Williams, Joseph A., 3,975,115.

Hyson, Archibald Miller, to Du Pont de Nemours, E. I., and Company. Liquid water-soluble insecticidal concentrates of S-methyl N-[(methylcarbamoyl)-oxy]thioacetimidate. 3,975,518, Cl. 424-173.000.

I. D. Engineering, Inc.: *See—*
Martens, Henry J.; and Vandebult, Jan, 3,974,581.

Ichikawa, Masaru; Tanaka, Eiji; and Tamaru, Kenzi, to Sagami Chemical Research Center. Catalyst for hydrodealkylation of alkylaromatic compounds and a process for producing the catalyst. 3,975,454, Cl. 260-672.00R.

Ichikawa, Yataro; Yamanaka, Yoshiyuki; Suzuki, Nobuo; and Tsuruta, Hideki, to Teijin Limited. Process for recovering purified 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadiene-1-one. 3,975,441, Cl. 260-586.00R.

ICI United States Inc.: *See—*
Long, William Penuel, Jr., 3,975,325.
Miller, Alfred D., 3,975,532.

Idaho Industrial Instruments, Inc. (Entire): *See—*
Morrison, Roderick G., 3,975,641.

Iijima, Tetsuya, to Nissan Motor Co., Ltd. Downshift control circuit for hydraulic transmission. 3,974,720, Cl. 74-866.000.

Ikeda, Tetsuo: *See—*
Murakami, Katsuhiko; Ikeda, Tetsuo; Takeda, Masahiro; Kazama, Osamu; and Nishinaka, Hidaka, 3,974,888.

Ikedo, Masaru; Yasuno, Yoshitake; and Yamashita, Tadaoki, to Matsushita Electric Industrial Co., Ltd. Device for storage and display of a radiation image. 3,975,637, Cl. 250-327.000.

Illg, Peter: *See—*
Lenk, Erich; and Illg, Peter, 3,974,973.

Imperial Chemical Industries Inc.: *See—*
Etchells, Sylvia, 3,975,351.

Imperial Chemical Industries Limited: *See—*
Gent, Colin William, 3,975,169.
Kendall, Matthew Giles, 3,975,565.
Staniland, Philip Anthony; and Jarrett, Graham, 3,975,249.

Inamori, Kazuo, to Kyoto Ceramic Co., Ltd. Golf club head with ceramic face plate. 3,975,023, Cl. 273-173.000.

Indian Head Inc.: *See—*
Grosh, James L., 3,974,599.

Indianapolis Center for Advanced Research, Inc. non-profit: *See—*
Eggleton, Reginald C.; and Johnston, Kenneth W., 3,974,826.
Indresaeter, Harald, to Gifford-Hill & Company, Inc. Self-correcting linearly movable irrigation system. 3,974,845, Cl. 137-1.000.
Industrial Automation Corporation: *See—*
Peyton, John J.; and Wyman, James H., 3,975,260.
Inoue, Jun: *See—*
Okada, Masaru; and Inoue, Jun, 3,975,004.
Inouye, Shigeharu: *See—*
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.
Inspection Technology Development, Inc.: *See—*
Beaver, Ruby C., 3,974,680.
Institut Francais du Petrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activities Petrolieres Elf: *See—*
Courty, Philippe; Sugier, Andre; and Le Page, Jean-Francois, 3,975,302.
Intel Corporation: *See—*
Stoll, Peter A., 3,975,671.
International Business Machines Corporation: *See—*
Appel, Ulrich, 3,975,686.
Besseyre, Jacques A.; Jacquart, Christian A.; and Marijon, Jean-Louis H., 3,975,588.
Foster, Betty Jane; Langston, Perry Robert, Jr.; and Tummala, Rao Ramamohana, 3,975,175.
Hochberg, Frederick; and Reisman, Arnold, 3,974,769.
Janson, Norma M.; and Yakubowski, Carl, 3,974,709.
King, Francis Kong, 3,975,769.
Lin, Charles Chia-Hsiung, 3,975,772.
Quinn, Robert Michael; Schucle, William John; and Unis, Richard Alan, 3,975,220.
Solyst, Erik R., 3,975,741.
Weinberger, Arnold, 3,975,623.
International Magna Corporation: *See—*
Placek, Eugene W., 3,975,140.
International Nickel Company, Inc., The: *See—*
Brockett, Frank Howard, III; Philp, James E.; and Sullivan, Arthur Francis, 3,975,054.
International Telephone and Telegraph Corporation: *See—*
Blakesley, Roland Francis; and Dunn, Daniel Lincoln, 3,975,079.
Dunn, James Grant; Cowan, John Richard; and Russo, Anthony Joseph, 3,975,587.
International Tools (1973) Ltd.: *See—*
Domaracki, John F.; McBride, Leonard M.; and Wack, Frank, 3,974,928.
Inukai, Kan: *See—*
Fujii, Shozo; and Inukai, Kan, 3,975,424.
Ionics Lyo Products Company: *See—*
Lock, Peter Maurice, 3,975,567.
Irvine, Robert: *See—*
Luperti, Harry E.; Irvine, Robert; and Hordeski, Edward R., 3,974,749.
Ise, Masahiro: *See—*
Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,975,661.
Ishibashi, Shizuka: *See—*
Sato, Kazuhiro; Ishibashi, Shizuka; and Eto, Yoshizumi, 3,975,657.
Ishihara, Hideo: *See—*
Watanabe, Teruji; and Ishihara, Hideo, 3,975,710.
Ishihara, Toshinobu: *See—*
Kitagaki, Tetsuro; Yamamoto, Akira; and Ishihara, Toshinobu, 3,975,446.
Ishikawa, Takatoshi: *See—*
Kawakami, Takeshi; Tani, Tsutomu; Ishikawa, Takatoshi; and Hirabayashi, Syoji, 3,975,653.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, 3,974,794.
Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, 3,974,617.
Istituto Sieroterapico A Vaccinogeno Toscano "Sciavo" S.p.A.: *See—*
Mannucci, Enzo Sergio, 3,975,103.
ITL Industries, Inc.: *See—*
Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,975,108.
Ito, Fumiyuki: *See—*
Sagawa, Seiji; Kimura, Osamu; Sekimori, Kenji; and Ito, Fumiyuki, 3,975,417.
Ito, Matsutoshi; Nishikawa, Tatsuo; and Takeshita, Kano, to Canon Kabushiki Kaisha. Device for controlling the density of printing characters. 3,975,707, Cl. 346-76.00R.
Itoh, Masashi: *See—*
Obata, Shuichi; Kagata, Akira; Morita, Katsuhiko; Kubo, Masatoyo; and Itoh, Masashi, 3,975,025.
Itoi, Kazuo: *See—*
Fujita, Yoshiji; Nishida, Takashi; and Itoi, Kazuo, 3,975,451.
Iversen, Poul Christian Carlos: *See—*
Hallgreen, Knud Julius; and Iversen, Poul Christian Carlos, 3,975,620.
Ivey, John S., to Borg-Warner Corporation. Fluid actuator for a rotating engageable friction device. 3,974,743, Cl. 91-422.000.
Iwasaki, Kiyotoshi: *See—*
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, 3,975,242.
J.A. Henckels Zwillingswerk Aktiengesellschaft: *See—*
Koch, Ulf, 3,974,563.
J. F. Pritchard and Company: *See—*
Richardson, Frank Peter; and Young, David Anthony, 3,975,508.
J. I. Case Company: *See—*
Rach, David T., 3,974,896.
Rhodes, Keith H., 3,974,631.
J. T. Baker Chemical Company: *See—*
Seidenberger, James W., 3,975,298.
Jacks, Thomas J.; Barker, Robert H.; and Hensarling, Thomas P., to United States of America, Agriculture. Solubilization of protein with ethanol-acetonitril-water solvent system. 3,975,343, Cl. 260-112.00R.
Jackson, Morden A. Flameless reboiler for reconcentrating liquid desiccant. 3,975,229, Cl. 159-31.000.
Jackson, Thomas Peter: *See—*
Boyle, Robert John; Rucker, Howard Lewis; Mastro, Alex Anthony; and Jackson, Thomas Peter, 3,975,026.
Jacobs Manufacturing Company Limited, The: *See—*
Derbyshire, George Cecil, 3,974,868.
Jacobs, Willi: *See—*
Beermann, Heinrich; Jacobs, Willi; and Lambrecht, Dietrich, 3,975,655
Jacquart, Christian A.: *See—*
Besseyre, Jacques A.; Jacquart, Christian A.; and Marijon, Jean-Louis H., 3,975,588.
Jacques, James O.; Kockler, Barry C.; and Weller, Frank M., Jr., to Genisco Technology Corporation. Removable cartridge flexible disc memory apparatus. 3,975,768, Cl. 360-99.000.
Jaggle, Gunther: *See—*
Stumpp, Gerhard; Jaggle, Gunther; Krauss, Rudolf; and Scharl, Herbert, 3,974,809.
Jakobi, Gunther: *See—*
Hachmann, Klaus; Jakobi, Gunther; Weber, Rudolf; Boeck, Alexander; and Jung, Dieter, 3,975,280.
Janosky, Milton J., to Sanders Associates, Inc. Off-center radar display circuit. 3,975,662, Cl. 315-378.000.
Jansen, Josephus Johannes Maria, to Koninklijke Textielfabrieken. Method of knitting socks having a closed toe. 3,974,525, Cl. 2-61.000.
Janson, Norma M.; and Yakubowski, Carl, to International Business Machines Corporation. Screw and follower positioning device. 3,974,709, Cl. 74-424.80A.
Jantzen, Johannes Kristoffer, Jr., to Addressograph Multigraph Corporation. Platen for strip-up microfiche. 3,974,582, Cl. 40-106.100.
Japan Exlan Company Limited: *See—*
Sekiguchi, Hideto; Sone, Masao; and Sato, Mitsunori, 3,975,486.
Jarrett, Graham: *See—*
Staniland, Philip Anthony; and Jarrett, Graham, 3,975,249.
JAWA, narodni podnik: *See—*
Cervinka, Jaroslav; Hofman, Oldrich; and Husak, Pavel, 3,974,901.
Jennings, Lawrence Joseph: *See—*
Bergquist, Everett John; and Jennings, Lawrence Joseph, 3,975,245.
Jerabek, Robert D.: *See—*
Marchetti, Joseph R.; and Jerabek, Robert D., 3,975,250.
Jet Line Products, Inc.: *See—*
Marcell, William B., 3,974,980.
Johann A. Wulfing Fabrik Pharmazeutischer Praparate: *See—*
Schmidt, Kurt H., 3,975,373.
Johanson, Donald L., to United States Surgical Corporation. Directional/non-directional hearing aid. 3,975,599, Cl. 179-107.0FD.
John, Wolfgang: *See—*
Fastert, Herbert; John, Wolfgang; and Backhaus, Karl L., 3,974,874.
John Z. DeLorean Corporation: *See—*
McLean, Robert F.; and Hofer, Peter H., 3,975,492.
Johns-Manville Corporation: *See—*
Boyle, Robert John; Rucker, Howard Lewis; Mastro, Alex Anthony; and Jackson, Thomas Peter, 3,975,026.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Automatic exposure control system. 3,975,744, Cl. 354-29.000.
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., to Tilt-A-Bed Corporation, The. Bed and lounge unit. 3,974,529, Cl. 5-18.00R.
Johnson, Gordon L.: *See—*
Brenan, Robert R.; and Johnson, Gordon L., 3,974,954.
Johnson, Howard L., to Caterpillar Tractor Co. Lock valve assembly. 3,974,742, Cl. 91-420.000.
Johnson & Johnson: *See—*
Buck, Carl J., 3,975,422.
Mesek, Frederick K., 3,975,222.
Johnson, Lee W.: *See—*
Wahlstedt, Robert L.; Rasmussen, Robert F.; and Johnson, Lee W., 3,974,902.
Johnson, Richard B., to American Chain & Cable Company, Inc. Tilting tray sorting conveyor. 3,974,909, Cl. 198-155.000.

Johnson, Robert P.: *See—*
Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., 3,975,541.

Johnson, Theodore C.; and Snodgrass, James D., to Heds, Inc. Apparatus for treatment of aqueous sewage composition. 3,975,256, Cl. 204-275.000.

Johnson, Wendell C., to Xerox Corporation. Key arm mechanism. 3,974,905, Cl. 197-98.000.

Johnston, Kenneth W.: *See—*
Eggleton, Reginald C.; and Johnston, Kenneth W., 3,974,826.

Johnstone, Edmund H. Aircraft wing vortex deflector. 3,974,986, Cl. 244-40.00R.

Jonckers, Kees: *See—*
Packbier, Mathijs W.; and Jonckers, Kees, 3,975,472.

Jones, Howard S., Jr.; and Reggia, Frank, to United States of America, Army. Radome-antenna structure. 3,975,737, Cl. 343-770.000.

Jones, Robert J., to TRW Inc. Poly(diels-alder) polymer. 3,975,363, Cl. 260-47.0UA.

Jones, Robert N.; and Swarthout, David J., to Xerox Corporation. Method for improving the photo-induced discharge characteristics of certain cadmium chalcogenides. 3,975,306, Cl. 252-501.000.

Jones, William C. Resilient spacer pad for an article in a box. 3,975,564, Cl. 428-174.000.

Josef Meissner, Firma: *See—*
Mayer, Hans Rolf Jakob; Langecker, Gerhard; and Gebauer, Hans-Jurgen, 3,975,452.

Josef Voss KG: *See—*
Wolter, Heinz, 3,974,670.

Josephson, Edgar F., to ACF Industries, Incorporated. Baffled bulk shipment of lading in convertible railway cars. 3,974,781, Cl. 105-243.000.

Joslyn, John. Musical toy. 3,974,731, Cl. 84-404.000.

Jossic, Alain Francois, to Compagnie Honeywell Bull (Societe Anonyme). Apparatus for correcting the way in which print hammers strike. 3,974,765, Cl. 101-111.000.

Jost, Max: *See—*
Wick, Arnold; and Jost, Max, 3,975,410.

Joy Manufacturing Company: *See—*
Peterson, Harley G.; and Crough, Donald E., 3,975,173.

Jung, Dieter: *See—*
Hachmann, Klaus; Jakobi, Gunther; Weber, Rudolf; Boeck, Alexander; and Jung, Dieter, 3,975,280.

Jurich, Rade: *See—*
Bokalders, Janis A.; and Jurich, Rade, 3,974,919.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Fuhrmann, Siegfried, 3,974,862.

Kabushiki Kaisha Daini Seikosha: *See—*
Kamiya, Masaaki, 3,974,636.

Kabushiki Kaisha Ishida Koki Seisakusyo: *See—*
Murakami, Katsuhiko; Ikeda, Tetsuo; Takeda, Masahiro; Kazama, Osamu; and Nishinaka, Hidaka, 3,974,888.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Mita, Masazo; and Nagatomo, Masatsugu, 3,974,899.
Satsumabayashi, Kazuyoshi; and Kato, Takeshi, 3,975,028.
Terai, Akio; Tanaka, Michiya; Todorobaru, Yasuhiro; and Sugihira, Tuneo, 3,974,881.

Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Uchino, Kenju, 3,974,570.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Morikawa, Takashi; Kihara, Hidetoshi; Urifu, Tohru; and Takahashi, Hisateru, 3,974,635.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kato, Takayuki, 3,975,706.

Kagata, Akira: *See—*
Obata, Shuichi; Kagata, Akira; Morita, Katsuhiko; Kubo, Masatoyo; and Itoh, Masashi, 3,975,025.

Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Vacuum actuated ship mooring devices. 3,974,794, Cl. 114-230.000.

Kali-Chemie Aktiengesellschaft: *See—*
Hauschild, Ulrich; Musall, Reimar; and Schroder, Hans-Jurgen, 3,975,503.

Kalinin, Lev Pavlovich: *See—*
Boshnyaga, Valery Anatolievich; Kalinin, Lev Pavlovich; and Postolaty, Vitaly Mikhailovich, 3,975,673.

Kalkbrenner, Ralph W., to Westinghouse Electric Corporation. Seal arrangement for turbine diaphragms and the like. 3,975,114, Cl. 415-217.000.

Kamata, Yasuhiko: *See—*
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Kamaya, Naoki, to Sony Corporation. Tape recording and/or reproducing apparatus. 3,975,765, Cl. 360-60.000.

Kamikado, Toshiya; Kuragano, Takashi; Konishi, Kazuo; Sato, Yasuo; and Nagano, Masayoshi, to Takeda Chemical Industries, Inc. Miticidally active compositions. 3,975,538, Cl. 424-301.000.

Kamikawa, Kiyohide, to Shimano Industrial Company, Limited. Fishing reel. 3,974,977, Cl. 242-84.10R.

Kamisaka, Kosey: *See—*
Kato, Makota; Kamisaka, Kosey; and Okino, Yoshihiro, 3,975,081.

Kamiya, Masaaki, to Kabushiki Kaisha Daini Seikosha. Booster circuit for a liquid crystal display device of a timepiece. 3,974,636, Cl. 58-23.00R.

Kampf, Gunther: *See—*
Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, 3,975,225.

Kanai, Kenji: *See—*
Kobayashi, Fukashi; Taniguchi, Hiroshi; and Kanai, Kenji, 3,975,764.

Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, to Sharp Kabushiki Kaisha. Driving method for a thin-film electroluminescent element of a three-layer construction. 3,975,661, Cl. 315-169.0TV.

Kane, Lawrence M., to Medtronic, Inc. Body-implantable lead. 3,974,834, Cl. 128-418.000.

Kanegafuchi Chemical Industries Co., Ltd.: *See—*
Tsubota, Katsuya; Motani, Shigeru; Hasue, Tatsuo; and Nijima, Yasuhiro, 3,975,338.

Kanekawa, Akira: *See—*
Sugahara, Mitsuaki; Sato, Teizo; Kobayashi, Sakae; and Kanekawa, Akira, 3,975,207.

Kanou, Yasuo: *See—*
Yamanaka, Seisuke; Kanou, Yasuo; Mifune, Tadayoshi; and Shimada, Satoshi, 3,975,760.

Kansai Paint Company, Ltd.: *See—*
Sagane, Masahiko, 3,975,287.

Kantor, Sidney: *See—*
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 3,975,528.

Kantorowicz, Gerard, to Thomson-CSF. Acoustic storage device for the correlation in particular of two high frequency signals. 3,975,696, Cl. 333-30.00R.

Kao, Wenling: *See—*
Strike, Donald P.; and Kao, Wenling, 3,975,421.

Kaplan, Earl, to American Cyanamid Company. Free-flowing blends of hexa(methoxymethyl)-melamine, carbon black and silica compounds. 3,975,296, Cl. 252-383.000.

Kaplan, Herman: *See—*
Nelson, George R., Jr.; and Kaplan, Herman, 3,974,879.

Kappner, Frank M. Firearms accessories. 3,974,586, Cl. 42-1.00S.

Karasuno, Nobumi: *See—*
Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, 3,974,617.

Karner, Karl. Structural element. 3,974,612, Cl. 52-309.000.

Kasahara, Kohichi: *See—*
Sano, Shunichi; and Kasahara, Kohichi, 3,975,766.

Kastelic, Raymond: *See—*
Racunas, Bernard J.; and Kastelic, Raymond, 3,975,149.

Kato, Makota; Kamisaka, Kosey; and Okino, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Signal recording system. 3,975,081, Cl. 350-3.500.

Kato, Shogo. Conveyer for removing floating objects. 3,975,275, Cl. 210-160.000.

Kato, Takayuki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Abnormality-detecting device in a brake system. 3,975,706, Cl. 340-52.00A.

Kato, Takeshi: *See—*
Satsumabayashi, Kazuyoshi; and Kato, Takeshi, 3,975,028.

Katsumata, Mitsuo, to Kokusan Denki Co., Ltd. Signal source for use in a breakerless ignition system for an internal combustion engine. 3,974,815, Cl. 123-148.0CC.

Kaufman, Alan D.; Reistad, Arne M., Jr.; and Wilke, David J., to Pennsylvania Wire Rope Corporation. Auxiliary brake lever. 3,974,712, Cl. 74-479.000.

Kawada, Yasuzi: *See—*
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; Kawada, Yasuzi; and Okamura, Hisanori, 3,975,612.

Kawagoe, Hiroto; and Nomiya, Kosei, to Hitachi, Ltd. Electronic circuit using field effect transistor with compensation means. 3,975,649, Cl. 307-304.000.

Kawaguchi, Munetaka; and Ueba, Yoshinobu, to Sumitomo Electric Industries, Ltd. Self-bonding magnet wire. 3,975,571, Cl. 428-371.000.

Kawakami, Hideaki, to Hitachi, Ltd. Method and device for driving in time division fashion field effect mode liquid crystal display device for numeric display. 3,975,726, Cl. 340-336.000.

Kawakami, Hiromi: *See—*
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Kawakami, Takeshi; Tani, Tsutomu; Ishikawa, Takatoshi; and Hirabayashi, Syoji, to Mitsubishi Denki Kabushiki Kaisha. Creeping discharge and partial discharge prevention means for a coil end of a rotary electric machine. 3,975,653, Cl. 310-196.000.

Kawamura, Kazuhiro: *See—*
Mizutani, Kunihiko; Aoyama, Takami; and Kawamura, Kazuhiro, 3,975,125.

Kawashima, Toshihide: *See—*
Yamada, Tatsuya; Kawashima, Toshihide; and Oozeki, Takashi, 3,975,085.

Kawawa, Takaho: Arimura, Tohru; and Okado, Masaru, to Nippon Kokan Kabushiki Kaisha. Continuous casting process. 3,974,559, Cl. 29-527.700.

Kay, Darrell R., to United States of America, Air Force. Two's complement subtracting system. 3,975,624, Cl. 235-175.000.

Kazama, Osamu: *See—*
Murakami, Katsuhiko; Ikeda, Tetsuo; Takeda, Masahiro; Kazama, Osamu; and Nishinaka, Hidaka. 3,974,888.

Kazares, Richard Elliott: *See—*
Wireman, Jack; and Kazares, Richard Elliott. 3,975,126.

Keating, Stephen Joseph, Jr., to Combustion Engineering, Inc. Hydrogen concentration control utilizing a hydrogen permeable membrane. 3,975,170, Cl. 55-16.000.

Keichinger, Albert. Bin sweeper. 3,974,908, Cl. 198-93.000.

Keim, Karl H., to United Industrial Syndicate, Inc. Devices for use in the application of working pressures and apparatus including such devices. 3,975,132, Cl. 425-406.000.

Keller, Dwight E.: *See—*
Bowling, Roy E.; Buchtel, Arnold J.; and Keller, Dwight E., 3,975,723.

Kelley, Thomas P., to Honeywell Inc. Thermal printing-anti-stick mechanism. 3,975,742, Cl. 346-76.00R.

Kendall, Matthew Giles, to Imperial Chemical Industries Limited. Fibrous structure. 3,975,565, Cl. 428-284.000.

Kendrick, Thomas C.: *See—*
Falender, James R.; Lindsey, Sarah E.; Ward, Andrew H.; and Kendrick, Thomas C., 3,975,455.

Kenly, Donald F. Method and apparatus for excluding water or other material from a blast hole in rock. 3,974,656, Cl. 61-35.000.

Kepler, Charles Edward, to United Technologies Corporation. Variable geometry ramjet engine. 3,974,648, Cl. 60-204.000.

Kerr-McGee Chemical Corporation: *See—*
Bowerman, Paul David, 3,975,495.

Kerzman, Jack A.; and Rail, Helmut. Wad unit for shotgun shell. 3,974,775, Cl. 102-95.000.

Kester, Ralph C., Jr. Multiple musical instrument holder for marching. 3,974,732, Cl. 84-421.000.

Keuffel & Esser Company: *See—*
Levinos, Steven, 3,975,243.

Kibby, Robert M., to Reynolds Metals Company. Treatment of carbothermically produced aluminum. 3,975,187, Cl. 75-10.00R.

Kibler, Alfred G., to NCR Corporation. Printer mechanism. 3,974,951, Cl. 226-143.000.

Kidd, James Kenneth, executor: *See—*
Powlesland, John W., deceased; Kidd, James Kenneth, executor; and Powlesland, Isabella, executrix, 3,974,754.

Kidder, Jay T.: *See—*
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., 3,974,529.

Kienzle, Frank; and Mayer, Hans Johann, to Hoffmann-La Roche Inc. Novel polyene compounds and process therefor. 3,975,445, Cl. 260-590.00C.

Kihara, Hidetoshi: *See—*
Morikawa, Takashi; Kihara, Hidetoshi; Urifu, Tohru; and Takahashi, Hisateru, 3,974,635.

Kijima, Takeshi: *See—*
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Kilgore, Lee A.; Godwin, Gurney L.; and Whitney, Eugene C., to Westinghouse Electric Corporation. Asynchronous tie. 3,975,646, Cl. 307-21.000.

Kim, Yung K.; and Riley, Michael O., to Dow Corning Corporation. Low temperature reversion resistant organosilicon polymers. 3,975,362, Cl. 260-46.50G.

Kimura, Osamu: *See—*
Sagawa, Seiji; Kimura, Osamu; Sekimori, Kenji; and Ito, Fumiyuki, 3,975,417.

Kimura, Takanori: *See—*
Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, 3,974,617.

King, Francis Kong, to International Business Machines Corporation. Storage device utilizing flexible magnetic disks. 3,975,769, Cl. 360-99.000.

King, George J.: *See—*
Barteau, John F.; King, George J.; and Saenz, August M., 3,975,070.

Kinjerski, Theodore Andrew: *See—*
Van Der Meulen, Sjaak Johan; Weizenbach, Bauke; Mackiw, Vladimir N.; and Kinjerski, Theodore Andrew, 3,975,190.

Kinney, Leslie J.; and Knapp, Edward M. Oil burner. 3,975,138, Cl. 431-161.000.

Kinsella, Howard R.; and Fernstrom, Carl F., to Emerson Electric Co. Burner control system with cycling pilot burner. 3,975,135, Cl. 431-43.000.

Kipping, Anders S. E.: *See—*
Lindblom, K. Julius; and Kipping, Anders S. E., 3,974,779.

Kircher, Morton S., to Olin Corporation. Inter-electrode spacing in diaphragm cells. 3,975,255, Cl. 204-252.000.

Kirchgebner, Manfred: *See—*
Hecht, Horstmar; Laue, Wolfgang; and Kirchgebner, Manfred, 3,975,513.

Kirk, Charles E.: *See—*
Cross, Christopher G.; Kirk, Charles E.; and Molnar, James R., 3,974,914.

Kirk, Donald, Jr.; and Paolini, Michael J., to Columbia Pictures Industries, Inc. Electronic communications system for supplementary video program distribution. 3,975,585, Cl. 178-5.100.

Kishi, Tadashi: *See—*
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, 3,974,794.

Kishimoto, Akira: *See—*
Hirata, Sadao; Yamada, Muneki; and Kishimoto, Akira, 3,975,463.

Kita, Edward Kiyoshi; and Matsui, Noriyoshi. Banding device. 3,974,762, Cl. 100-9.000.

Kita, Hisanao: *See—*
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; Kawada, Yasuzi; and Okamura, Hisanori, 3,975,612.

Kitagaki, Tetsuro; Yamamoto, Akira; and Ishihara, Toshinobu, to Shinetsu Chemical Company. Method for the preparation of unsaturated ketones. 3,975,446, Cl. 260-593.00R.

Kitamura, Masatsugu, to Victor Company of Japan, Limited. Signal time compression or expansion system. 3,975,763, Cl. 360-8.000.

Klabunde, Ulrich, to Du Pont de Nemours, E. I., and Company. Preparation of o-iodoaniline. 3,975,438, Cl. 260-578.000.

Klabunde, Ulrich, to Du Pont de Nemours, E. I., and Company. Preparation and amination of iodoaniline. 3,975,439, Cl. 260-581.000.

Klaus, Michael Josef: *See—*
Mayer, Hans Johann; Fischli, Albert Eduard; Klaus, Michael Josef; and Wick, Alexander Eduard, 3,975,406.

Klecker, James D. Disposable enema evacuant collection system. 3,974,533, Cl. 4-112.000.

Klein Associates, Inc.: *See—*
Klein, Martin, 3,975,704.

Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., to Seiscom Delta Inc. Printer for color display of geophysical and other data. 3,975,636, Cl. 250-327.000.

Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., to Seiscom Delta Inc. Color display of geophysical and other data. 3,975,705, Cl. 340-15.5DS.

Klein, Jacob: *See—*
Schaffner, Joseph G.; Werner, Joseph A.; and Klein, Jacob, 3,974,774.

Klein, Martin, to Klein Associates, Inc. Method of and apparatus for sonar and related signal texture enhancement of recording media. 3,975,704, Cl. 340-3.00F.

Kline, Edward, to V-Mark Automation Ltd. Product labelling machine. 3,975,227, Cl. 156-361.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. Age resisters for oxidizable polymers. 3,975,360, Cl. 260-45.85R.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. N,N-bis(4-anilinophenyl)-4,7-dithia-5-methyldecanediamide and related compounds useful as polymer stabilizers. 3,975,414, Cl. 260-42.470.

Klingenberg, Gordon U.: *See—*
Murray, Gerald J., Jr.; and Klingenberg, Gordon U., 3,974,796.

Klose, Karl W., to Cooper Tire and Rubber Company. Self-centering feed conveyor. 3,974,953, Cl. 226-189.000.

Klotzsche, Heinz: *See—*
Behrens, Dieter; and Klotzsche, Heinz, 3,975,683.

Knapp, Edward M.: *See—*
Kinney, Leslie J.; and Knapp, Edward M., 3,975,138.

Knapp, Heinrich; Brettschneider, Johannes; and Bundesen, Lorenz, to Robert Bosch G.m.b.H. Fuel metering system for internal combustion engines. 3,974,813, Cl. 123-140.0MC.

Knobel, Fritz; and Meili, Ernst, to F. Knobel Elektro-Apparatebau AG. Starterless low-voltage fluorescent-lamp circuit arrangements. 3,975,660, Cl. 315-102.000.

Knotex Maschinenbau GmbH: *See—*
Baer, Hans; and Reichert, Kurt, 3,974,551.

Knoth, Walter Henry, Jr.; and Mrowca, Joseph John, to Du Pont de Nemours, E. I., and Company. Preparation of aromatic phosphine oxides by reaction of diarylhalophosphine and benzylic halide. 3,975,447, Cl. 260-606.50P.

Knudson, Richard C.; and Bolton, John R. Photopolymer image inlays. 3,975,561, Cl. 428-67.000.

Kobayashi, Fukashi; Taniguchi, Hiroshi; and Kanai, Kenji, to Matsushita Electric Industrial Co., Ltd. Television signal recording and reproducing system. 3,975,764, Cl. 360-23.000.

Kobayashi, Sakae: *See—*
Sugahara, Mitsuaki; Sato, Teizo; Kobayashi, Sakae; and Kanekawa, Akira, 3,975,207.

Koch, S. Don, to Ashland Oil, Inc. Liquid amine compositions. 3,975,295, Cl. 252-357.000.

Koch, Ulf, to J.A. Henckels Zwillingswerk Aktiengesellschaft. Scissors, particularly household- or tailor-scissors. 3,974,563, Cl. 30-341.000.

Kochanowsky, Boris J. Mining methods as such and combined with equipment. 3,975,053, Cl. 299-7.000.

Kockler, Barry C.: *See—*
Jacques, James O.; Kockler, Barry C.; and Weller, Frank M., Jr., 3,975,768.

Kodama, Jiro K.; Haynes, George R.; and Albert, James R., to Shell Oil Company. Therapeutic agents. 3,975,533, Cl. 424-326.000.

Kohler, Reinhard: *See—*
Hofmann, Wilfried; Dietrich, Karl-Heinz; Rauffer, Walter; Schuhmeir, Eugen; and Kohler, Reinhard, 3,975,749.

Koike, Masahiko, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm playing apparatus. 3,974,729, Cl. 84-1.030.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Watanabe, Teruji; and Ishihara, Hideo, 3,975,710.

Kokusan Denki Co., Ltd.: *See—*
Katsumata, Mitsuo, 3,974,815.
Kondo, Tetsuya; and Watanabe, Takeshi, 3,974,805.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Tiliander, Gosta Ador Evert, 3,974,719.

Kondo, Kiyosi; and Mori, Fumio, to Sagami Chemical Research Center. Process for preparing γ-lactone derivatives. 3,975,381, Cl. 260-240.00R.

Kondo, Tetsuya; and Watanabe, Takeshi, to Kokusan Denki Co., Ltd. Ignition system for an internal combustion engine. 3,974,805, Cl. 123-118.000.

Kondo, Toshiyuki; and Nishimura, Takumi, to Aisin Seiki Kabushiki Kaisha. Powered brake system for vehicles. 3,975,061, Cl. 303-21.0AF.

Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, to Bayer Aktiengesellschaft. Penicillins. 3,975,375, Cl. 260-239.100.

Konig, Hubert: *See*—
Muller, Anton; and Konig, Hubert, 3,974,871.

Koninklijke Textielfabrieken: *See*—
Jansen, Josephus Johannes Maria, 3,974,525.

Konishi, Kazuo: *See*—
Kamikado, Toshiya; Kuragano, Takashi; Konishi, Kazuo; Sato, Yasuo; and Nagano, Masayoshi, 3,975,538.

Konishi, Shinichi, to Denyo Kabushiki Kaisha. Vertical position welding method and apparatus for practicing the method. 3,975,615, Cl. 219-126.000.

Konrad, Eugen: *See*—
Wajaroff, Theodor; and Konrad, Eugen, 3,975,515.

Konrath, Karl, to Robert Bosch G.m.b.H. Speed regulator for fuel injection pumps. 3,974,812, Cl. 123-139.0St.

Konstantin, Anatole Ethan. Banding machine. 3,974,628, Cl. 53-291.000.

Kopaska, Larry A. Baled hay transporter. 3,974,926, Cl. 214-352.000.

Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing an N,N-bis-(3-phenoxy-2-hydroxypropyl)-alkylenediamine and method of use. 3,975,539, Cl. 424-304.000.

Kosikowski, Frank V., to Cornell University. Flavor development by enzyme preparation in natural and processed cheddar cheese. 3,975,544, Cl. 426-35.000.

Kovar, Robert F.; and Arnold, Fred E., to United States of America, Air Force. Ethynyl-substituted aromatic ortho diamines and method of synthesis. 3,975,444, Cl. 260-571.000.

Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased (by Stoll, Suzanne, executrix), to Firmenich S.A. Cycloaliphatic unsaturated ketones as odor- and taste-modifying agents. 3,975,310, Cl. 252-522.000.

Kraatz, Gerald A.; Godsen, Ronald A.; Gunner, Herbert M., Jr.; and Tranquilla, Michael N., to Union Special Corporation. Fabric positioning holder. 3,974,787, Cl. 112-121.120.

Kraft, Larry A.: *See*—
Kraft, Patricia J.; Thomas, Marcia R.; and Kraft, Larry A., 3,975,156.

Kraft, Patricia J.; Thomas, Marcia R.; and Kraft, Larry A., to Ortho Diagnostics, Inc. Method and material for detecting and quantitating fetal erythrocytes in adults. 3,975,156, Cl. 23-230.00B.

Kraftwerk Union Aktiengesellschaft: *See*—
Beermann, Heinrich; Jacobs, Willi; and Lambrecht, Dietrich, 3,975,655.

Kraiss, Gerald G., to Avildsen Tools and Machines, Inc. Flat beaded double end track bit. 3,975,110, Cl. 408-228.000.

Kramer, James H., to B. F. Goodrich Company, The. Method of making a perforate article. 3,975,491, Cl. 264-255.000.

Kramer, Vance M., Sr. Apparatus for making flexible corrugated tubing. 3,975,129, Cl. 425-387.00B.

Kraus, Helmut: *See*—
Distler, Walter; Kraus, Helmut; Schwarz, Christian; and Schmidt, Oskar, 3,975,740.

Krauss-Maffei Aktiengesellschaft: *See*—
Schluter, Klaus, 3,975,128.

Krauss, Rudolf: *See*—
Stumpp, Gerhard; Jaggle, Gunther; Krauss, Rudolf; and Scharl, Herbert, 3,974,809.

Kroger, Richard A.; and Anderson, Larry E., to Kroger, Richard A. Television shut-off device. 3,975,688, Cl. 325-392.000.

Krogsrud, Harald, to Elkem-Spigerverket A/S. Rotatable furnace pot for smelting furnaces. 3,975,575, Cl. 13-10.000.

Krogsrud, Harald, to Elkem-Spigerverket A/S. Rotatable furnace pot including stoking means. 3,975,576, Cl. 13-10.000.

Krolick, Robert Stanley: *See*—
Tullis, Kay Jeanne; and Krolick, Robert Stanley, 3,974,898.

Kropp, Rudolf: *See*—
Reicheneder, Franz; Kropp, Rudolf; Amann, August; Giertz, Hubert; and Schuster, Joerg, 3,975,526.

Kroppenstedt, Dietmar, to Maschinenfabrik Goebel, GmbH. Web tension control device. 3,974,948, Cl. 226-38.000.

Kruck, Ralph E., to VCA Corporation. Interchangeable hypodermic needle assemblage. 3,974,832, Cl. 128-221.000.

Kubicek, Louis A. Combination extension and compression tool holder. 3,975,111, Cl. 408-239.00R.

Kubik, Peter Steve, to Bell Telephone Laboratories, Incorporated. Integrated circuit extraction tool. 3,974,556, Cl. 29-203.00B.

Kubo, Masatoyo: *See*—
Obata, Shuichi; Kagata, Akira; Morita, Katsuhiko; Kubo, Masatoyo; and Itoh, Masashi, 3,975,025.

Kuchek, Henry A., to Dow Chemical Company, The. Producing an electrode. 3,975,557, Cl. 427-126.000.

Kuenzy, Fred, to Fratmann S.A. Preparation of N-~(1-ethylpyrrolidinyl-2)-methyl]-2-methoxy-5-sulphamoyl-benzamide. 3,975,402, Cl. 260-326.820.

Kugelfischer Georg Schafer & Co.: *See*—
Hofmann, Heinrich; and Markfelder, Gunter, 3,975,066.

Kulick, Leonard; and Saad, Karim I., to Oxy Metal Industries Corporation. Tannin containing compositions. 3,975,214, Cl. 148-6.15R.

Kulka, Kurt; and Zazula, Teodosij, to Fritzsche Dodge & Olcott Inc. 2,4-Dihydroxy-3-methyl-benzaldehyde perfume compositions. 3,975,309, Cl. 252-522.000.

Kullman, Russell M. H.; and Reinhardt, Robert M., to United States of America, Agriculture. Methylolated reaction product of a hydroxy carbamate and cellulose-dyeing dyestuff containing vinyl sulfone groups. 3,975,370, Cl. 260-151.000.

Kummer, Werner: *See*—
Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, 3,975,539.

Kummins, Joel S.; and Smith, John C., Jr., to Dow Corning Corporation. Process for priming. 3,975,554, Cl. 427-8.000.

Kunda, Wasyl; and Huppmann, Winfried J., to Sherritt Gordon Mines Limited. Finely divided magnetic cobalt powder. 3,975,217, Cl. 148-105.000.

Kunert, Heinz-Peter, to U.S. Philips Corporation. Image section of an X-ray apparatus. 3,975,642, Cl. 250-468.000.

Kuragano, Takashi: *See*—
Kamikado, Toshiya; Kuragano, Takashi; Konishi, Kazuo; Sato, Yasuo; and Nagano, Masayoshi, 3,975,538.

Kuraray Co., Ltd.: *See*—
Fujita, Yoshiji; Nishida, Takashi; and Itoi, Kazuo, 3,975,451.
Ueeda, Ryuhei, 3,975,407.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sugahara, Mitsuaki; Sato, Teizo; Kobayashi, Sakae; and Kanekawa, Akira, 3,975,207.

Kuri, Takeshi: *See*—
Suzui, Akio; Yoshimoto, Hiroshi; and Kuri, Takeshi, 3,975,349.

Kurpanek, Waldemar Helmut. Valve particularly adapted for utilization in controlling the flow of blood. 3,974,854, Cl. 137-512.000.

Kurumada, Tomoyuki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Kwikform Limited: *See*—
Steele, Raymond Ernest, 3,975,106.

Kylberg, Gunnar, to Stal-Laval Turbin AB. Epicyclic gear torque absorbing pinion carrier. 3,974,718, Cl. 74-750.00R.

Kyodo Chemical Company, Ltd.: *See*—
Sagawa, Seiji; Kimura, Osamu; Sekimori, Kenji; and Ito, Fumiyuki, 3,975,417.

Kyoto Ceramic Co., Ltd.: *See*—
Inamori, Kazuo, 3,975,023.

Labana, Santokh S.; and Peng, Stephen C., to Ford Motor Company. Powder paint with epoxy and amide copolymer and anhydride. 3,975,456, Cl. 260-836.000.

Labedan, Pierre: *See*—
Coquery, Jean-Paul; Labedan, Pierre; and Roland, Raymond, 3,974,666.

LaBorde, Joseph N., to Ethyl Corporation. Liner for covering intersecting surfaces. 3,974,606, Cl. 52-288.000.

Lachema, narodni podnik: *See*—
Svoboda, Vlastimil; and Celechovska, Olga, 3,975,161.

Lachocki, Eugene, to RCA Corporation. Power supply with means to reduce on and off switching times of series regulated device. 3,975,672, Cl. 323-17.000.

Lacy, C. Lyle: *See*—
Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., 3,974,964.

Ladany, Ivan; Limm, Albert Chang; and O'Brien, James Thomas, to RCA Corporation. Method of making electrical contacts having a low optical absorption. 3,975,555, Cl. 427-85.000.

Lafayette Engineering & Manufacturing, Inc.: *See*—
York, Leonard R., 3,975,058.

La Haye, Frank W.: *See*—
Pelham, Joseph E.; and La Haye, Frank W., 3,974,772.

Laitram Corporation, The: *See*—
Fowler, John T., 3,975,621.
Lapeyre, James M., 3,975,490.

Lal, Joginder; and Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Polymers of nonconjugated 1,4-dienes. 3,975,336, Cl. 526-335.000.

Lambert, Marc, to Compagnie Industrielle de Filtration et d'Equipement Chimique. Process for the manufacture of solutions of halogens. 3,975,284, Cl. 252-187.00R.

Lambrecht, Dietrich: *See*—
Beermann, Heinrich; Jacobs, Willi; and Lambrecht, Dietrich, 3,975,655.

Lamparsky, Dietmar: *See*—
Helminger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,975,311.

Lancier, Peter, to Peter Lancier K.G. Maschinenbau-Hafenhuette. Distributor panel or board for compressed air monitoring systems. 3,974,856, Cl. 137-552.000.

Landwehrkamp, Hans: *See*—
Egli, Emil; and Landwehrkamp, Hans, 3,974,972.

Lane, Marvin K.; and Anderson, Winton C., to United States Gypsum Company. By-product gypsum fillers for mica-free joint compounds consisting of synthetic calcium sulphate dihydrate having a mean particle size of 11 or 12 microns. 3,975,320, Cl. 260-17.00R.

Langbein, Adolf: *See—*
Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, 3,975,368.

Langecker, Gerhard: *See—*
Mayer, Hans Rolf Jakob; Langecker, Gerhard; and Gebauer, Hans-Jurgen, 3,975,452.

Langsdorf, William P., to Du Pont de Nemours, E. I., and Company. Carbamoylphosphonates. 3,975,464, Cl. 260-923.000.

Langston, Perry Robert, Jr.: *See—*
Foster, Betty Jane; Langston, Perry Robert, Jr.; and Tummala, Rao Ramamohana, 3,975,175.

Lanigan, Daniel J.; and Cohen, Marvin M., to United States of America, Army. Gadolinium doped germanium. 3,975,756, Cl. 357-63.000.

Lanz, William E.: *See—*
Black, William J.; and Lanz, William E., 3,974,579.

Lapeyre, James M., to Laitram Corporation, The. Method of molding a reinforced tire from two preformed sections. 3,975,490, Cl. 264-250.000.

LaPierre, George W. Sine bar. 3,974,571, Cl. 33-174.00S.

Lark, John C.: *See—*
Holda, Eugene M.; and Lark, John C., 3,975,566.

Larkin, Kenneth A., to E. & J. Gallo Winery. Analog to digital encoder unit employing a pre-encoded film. 3,975,633, Cl. 250-237.00R.

Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, to Wolff & Kaaber. Polyfuran foams and a method of preparing same. 3,975,318, Cl. 260-2.50F.

Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, to Wolff & Kaaber. Polyfuran foams and a method of preparing same. 3,975,319, Cl. 260-2.50F.

Lassota, Marek J. Internal combustion engine with gyratory piston and cylinder movement. 3,974,803, Cl. 123-42.000.

Latham, Roy W.; and Schultz, Albert N., Jr., to Grumman Aerospace Corporation. Airborne positioning system. 3,975,731, Cl. 343-7.300.

Latten, Werner: *See—*
Schalles, Erhard; Latten, Werner; and Stender, Reinhard, 3,974,721.

Laue, Wolfgang: *See—*
Hecht, Horstmar; Laue, Wolfgang; and Kirchgebner, Manfred, 3,975,513.

Lauterberg, Werner: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

LaVerne, Albert A. Method and apparatus for carbon dioxide therapy (CDT) of addictons. 3,974,830, Cl. 128-212.000.

Lawn King, Inc.: *See—*
Wallick, Seymour Dudley; Sandler, Joseph J.; Sandler, Marc L.; and Zabroski, Frank, 3,974,967.

Lawson, John A., to Optigon Research & Development Corporation. Wide angle objective. 3,975,090, Cl. 350-214.000.

Lazaroms, Johannes C. J.: *See—*
Timmer, Hendrikus J. M.; and Lazaroms, Johannes C. J., 3,974,542.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique. Magnetic head devices enclosed by a shield having superposed layers and an intervening layer of solder. 3,975,771, Cl. 360-104.000.

Lazzari, Jean-Pierre: *See—*
Dejouhanet, Jean-Pierre; and Lazzari, Jean-Pierre, 3,975,773.

Leach, Bruce E.; Hritz, George G.; and Royer, Dennis Jack, to Continental Oil Company. Low-density, high-porosity alumina extrudates and a method for producing said extrudates. 3,975,510, Cl. 423-628.000.

Leach, Bruce E.: *See—*
Ziegenhain, William C.; Leach, Bruce E.; and Coleman, Dean O., 3,975,231.

Leblanc, Conrad L., to Foster Grant Co., Inc. Viewer. 3,975,474, Cl. 264-23.000.

Leckband, Uwe: *See—*
Wochnowski, Waldemar; Leckband, Uwe; Barth, Hans-Heinrich; and Hohm, Reinhard, 3,974,839.

Le Devehat, Jean: *See—*
Grunberg, Claude; and Le Devehat, Jean, 3,975,638.

Lednicer, Daniel; and Nishizawa, Edward E., to Upjohn Company, The. Aromatic azo sulfonylnitrene compounds. 3,975,371, Cl. 260-198.000.

Lee, Fui-Tseng H.: *See—*
Dounchis, Harry; and Lee, Fui-Tseng H., 3,975,153.

Lee, Sen Lin; and Hess, Ernst Peter, to Xerox Corporation. Endless loop ribbon cartridge with random storage. 3,974,906, Cl. 197-168.000.

Lee Wilson Engineering Company, Inc.: *See—*
Hill, Robert R.; and Beemer, Robert J., 3,975,145.

Lefkoff, Charles Berry. Thermodynamic motor with constant rotating power shaft driven by power sources with inconsistent cycles powered by a temperature differential caused by the evaporation of water. 3,974,653, Cl. 60-716.000.

Legleye, Andre Jules: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Lehmann, Serge, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Power thyristor having a high triggering speed. 3,975,754, Cl. 357-38.000.

Leibowitz, Marshall, to Timex Corporation. Electrochromic display element and process. 3,975,086, Cl. 350-160.00R.

le Maout, Theophile Francois: *See—*
Camboulives, Andre Alphonse Mederic Leon; le Maout, Theophile Francois; Rejzner, Jacques Serge; and Vandenbroucke, Roger Alfred Jules, 3,974,649.

Lenk, Erich; and Illg, Peter, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Doffing device for bobbin tubes or spools. 3,974,973, Cl. 242-41.000.

Lennon, John H., to Xerox Corporation. Xeroradiographic plate. 3,975,635, Cl. 250-315.00A.

Leonard, Richard L., to Monsanto Company. Method for producing highly permeable acrylic hollow fibers. 3,975,478, Cl. 264-41.000.

Le Page, Jean-Francois: *See—*
Courty, Philippe; Sugier, Andre; and Le Page, Jean-Francois, 3,975,302.

LePage, Madeleine, to Produits Chimiques Pechiney-Saint Gobain. Bodies of siliceous gels having large pores and process for preparing same. 3,975,293, Cl. 252-317.000.

Lerner, Julius, to Sun Oil Company of Pennsylvania. Double level gauge. 3,974,695, Cl. 73-304.00C.

Le Roy, Pierre: *See—*
Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, 3,975,385.

Leschinsky, Yakov Borisovich: *See—*
Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and Ruga, Viktor Astievich, administrator, 3,975,130.

LET-R-EDGE Of Canada Ltd.: *See—*
Minogue, Robert W.; and Troyer, Lloyd E., 3,974,552.

Levake, Bernice A.; and Levake, Richard N. Detachably fastenable swivel device. 3,974,587, Cl. 43-42.190.

Levake, Richard N.: *See—*
Levake, Bernice A.; and Levake, Richard N., 3,974,587.

Lever Brothers Company: *See—*
Davies, James Francis; Gilbert, Philip Alan; and Thompson, Laurence, 3,975,312.

Levinos, Steven, to Keuffel & Esser Company. Electrolytically induced polymerization utilizing diazotization of primary aromatic amines. 3,975,243, Cl. 204-72.000.

Levitt, Barry N.; Crocker, Thomas H.; and Chapman, Everett E., to United States of America, Air Force. Electronic coordinate transformation using multiplier circuits. 3,975,625, Cl. 235-189.000.

LEWA Herbert Ott Kommanditgesellschaft: *See—*
Fritsch, Horst, 3,974,714.

Lewis, George D.; and Garrison, Gary D., to United Technologies Corporation. Combustion instability reduction device having swirling flow. 3,974,647, Cl. 60-39.72P.

Lewis, Paul E., to A. B. Chance Company. Articulated crossarm assembly for electrical conductor support structure. 3,975,580, Cl. 174-45.00R.

Lignes Telegraphiques et Telephoniques: *See—*
Thepaut, Pierre, 3,975,691.

Lilicy, Peter: *See—*
Bradshaw, George W., 3,975,466.

Lilicy, Peter G.: *See—*
Bradshaw, George W., 3,975,466.

Lill, Viktor; Rossler, Ernst; Svoboda, Josef; and Weigl, Erwin, to Gertsch AG. Safety ski binding. 3,975,033, Cl. 280-618.000.

Limm, Albert Chang: *See—*
Ladany, Ivan; Limm, Albert Chang; and O'Brien, James Thomas, 3,975,555.

Lin, Charles Chia-Hsiung, to International Business Machines Corporation. Double shielded magnetoresistive sensing element. 3,975,772, Cl. 360-113.000.

Lincoln Electric Company, The: *See—*
Siktberg, Richard Philip; and Schiedermayer, Marvin Lee, 3,975,616.

Lincoln, Frank H., Jr.; Pike, John E.; and Youngdale, Gilbert A., to Upjohn Company, The. Bicyclic lactone intermediates. 3,975,404, Cl. 260-343.30R.

Lindback, Lars-Erik: *See—*
Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, 3,975,685.

Lindblom, K. Julius; and Kipping, Anders S. E., to Automatisk Doseringskompensator AB. Vehicle bogie. 3,974,779, Cl. 105-164.000.

Linde Aktiengesellschaft: *See—*
Ranke, Gerhard, 3,975,172.

Linden-Alimak AB: *See—*
Svensson, Torbjorn, 3,974,852.

Linderman, Gilbert I. Drivers log device. 3,974,568, Cl. 33-107.00R.

Lindsey, Sarah E.: *See—*
Falender, James R.; Lindsey, Sarah E.; Ward, Andrew H.; and Kendrick, Thomas C., 3,975,455.

Little Giant Products, Inc.: *See—*
Schuster, Frank C., 3,974,927.

Little, Paul V., to Dover Findings, Inc. Jewelry clasp member. 3,974,547, Cl. 24-201.0BN.

Lock, Peter Maurice, to Ionics Lyo Products Company. Surgical dressings. 3,975,567, Cl. 428-315.000.

Loev, Bernard: *See—*
Hill, David T.; and Loev, Bernard, 3,975,537.

Loffler, Bernhard: *See—*
Vering, Antonius; and Loffler, Bernhard, 3,975,147.

Logie, Charles F., to American Store Equipment Corporation. Partition system. 3,974,610, Cl. 52-285.000.

Logsdon, Donald N.: *See*—
Orozco, Gilbert H.; and Logsdon, Donald N., 3,974,674.

Long, David M., Jr., to University of Illinois Foundation. Non-toxic brominated perfluorocarbons radiopaque agents. 3,975,512, Cl. 424-5.000.

Long, Otto V. Apparatus and method for field burning and fog or smog control. 3,974,756, Cl. 98-58.000.

Long, William Penuel, Jr., to ICI United States Inc. Antistatic agent composition. 3,975,325, Cl. 260-23.0XA.

Loos, John H.: *See*—
Ferdelman, Donald C.; and Loos, John H., 3,974,661.

Lossini, Elio, to Raybeth Tool & Die Co., Inc. Slide locking assembly. 3,974,545, Cl. 24-116.00R.

Lotzgesell, James A.; Moser, Kenneth B.; and Hurst, Thomas L., to A. E. Staley Manufacturing Company. Method of peroxide thinning granular starch. 3,975,206, Cl. 127-71.000.

Lou, David Yuan Kong: *See*—
Fraser, David Bruce; and Lou, David Yuan Kong, 3,975,252.

Lovell, James Byron: *See*—
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 3,975,528.

Lovmark, August Otto. Device for converting wave energy in bodies of water. 3,974,652, Cl. 60-398.000.

Lowenhar, Herman. Transmission lines using tubular extendible structures. 3,975,581, Cl. 333-33.000.

LTG Lufttechnische GmbH: *See*—
Honmann, Winfried, 3,974,755.

Luffy, John W.: *See*—
Haupin, Warren E.; and Luffy, John W., 3,975,212.

Luini, Fulvio: *See*—
Arcari, Giuliana; De Micheli, Pietro; Luini, Fulvio; and Scarponi, Ugo, 3,975,389.

Lukens Steel Company: *See*—
Scott, William W., Jr., 3,974,698.

Lummus Industries, Inc.: *See*—
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,974,763.

Lumoprint Zindler KG: *See*—
Opravil, Egon, 3,975,096.

Lundquist, Hendrik W. Internal combustion engine. 3,974,802, Cl. 123-25.00R.

Luperti, Harry E.; Irvine, Robert; and Hordeski, Edward R., to Pitney-Bowes, Inc. Envelope flap separating and distending method and mechanism. 3,974,749, Cl. 93-61.00R.

Lusch, Peter; and Horenkamp, Franz, to Ferdinant Lusch KG. Adjustable bed. 3,974,530, Cl. 5-66.000.

Lusk, Joe F.; and Rood, William H., to T.S.W.S., Inc. Vehicle condition monitoring system. 3,975,708, Cl. 340-80.000.

Lutravil Spinnvlies GmbH & Co.: *See*—
Ruzek, Ivo; Worf, Guenther; Hartmann, Ludwig; Maahs, Paul; and Gerking, Lueder, 3,975,224.

Lynch, John W.: *See*—
Haarstick, Stephen H.; and Lynch, John W., 3,974,791.

Lynn, John R.: *See*—
Tate, George W., Jr., 3,974,829.

M & T Chemicals Inc.: *See*—
Russo, Robert V., 3,975,317.

Maahs, Paul: *See*—
Ruzek, Ivo; Worf, Guenther; Hartmann, Ludwig; Maahs, Paul; and Gerking, Lueder, 3,975,224.

Machtle, Fritz. Expandable anchor stud. 3,974,734, Cl. 85-67.000.

Mackiw, Vladimir N.: *See*—
Van Der Meulen, Sjaak Johan; Weizenbach, Bauke; Mackiw, Vladimir N.; and Kinjerski, Theodore Andrew, 3,975,190.

Maddox, Jim, Jr.: *See*—
Tate, Jack F.; and Maddox, Jim, Jr., 3,975,281.
Tate, Jack F.; Shupe, Russell D.; and Maddox, Jim, Jr., 3,975,282.

Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, to VEB Leuna-Werke "Walter Ulbricht". Textile floor covering with bottom of thermoplastic foam and a method of producing it. 3,975,562, Cl. 428-95.000.

Mader, Arthur H.; Gasiunas, Donatas V.; and Stark, Edward W., to Technicon Instruments Corporation. Automated calibration and standardization apparatus. 3,975,727, Cl. 340-347.0NT.

Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, to Nippon Telegraph and Telephone Public Corporation; and Mitsubishi Denki Kabushiki Kaisha. Radar data selection equipment. 3,975,730, Cl. 343-6.00R.

Mahler, Eddie G.; McAllister, Patrick R.; and Wilhoit, Eugene D., to Du Pont de Nemours, E. I., and Company. Process for recovery of hydrogen cyanide. 3,975,502, Cl. 423-372.000.

Mahotka, Hans; and Glastetter, Manfred, to NL Industries, Inc. Progressive slide assembly. 3,975,063, Cl. 308-3.800.

Maier, Alfred E.: *See*—
Hendry, Allen J.; and Maier, Alfred E., 3,975,701.

Makarov, Mikhailovich: *See*—
Sudnishnikov, Boris Vasilievich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; and Makarov, Mikhailovich, 3,974,885.

Malis, Jerry L.: *See*—
Fletcher, Horace; Malis, Jerry L.; and Yardley, John P., 3,975,436.

Malmberg, Paul R.: *See*—
Green, David; Nathanson, Harvey C.; and Malmberg, Paul R., 3,975,598.

Malmin, Oscar. Cartridge and sealing means therefor. 3,974,831, Cl. 128-218.00D.

Man-Gill Chemical Company: *See*—
Orozco, Gilbert H.; and Logsdon, Donald N., 3,974,674.

Manaka, Kazuo, to Broadview Chemical Corporation. Polymers and two-component sealant systems. 3,975,340, Cl. 526-312.000.

Mancuso, John Joseph: *See*—
Fioriti, Joseph Anthony; and Mancuso, John Joseph, 3,975,550.

Mannesmann Aktiengesellschaft: *See*—
Grebe, Klaus; de Haas, Hans; Dautzenberg, Norbert; and Hewing, Josef, 3,975,186.

Mannucci, Enzo Sergio, to Istituto Sieroterapico A Vaccinogeno Toscano "Sclavo" S.p.A. Photometric liquid analyzers for use in clinical or chemical laboratory analysis. 3,975,103, Cl. 356-184.000.

Maples, Ben, Jr.: *See*—
Owens, Paul J.; and Maples, Ben, Jr., 3,975,015.

Marass, Josef, to Georg Spiess GmbH. Stack changer in continuously operated sheet feeding machines. 3,975,011, Cl. 271-157.000.

Marcell, William B., to Jet Line Products, Inc. Wire dispensing device. 3,974,980, Cl. 242-128.000.

Marchetti, Joseph R.; and Jerabek, Robert D., to PPG Industries, Inc. Electrodeposition with reactive modifier for amine group-containing, acid-solubilized resins. 3,975,250, Cl. 204-181.000.

Mardesich, Nicholas: *See*—
Burger, Norman Donald, 3,974,945.

Marijon, Jean-Louis H.: *See*—
Besseyre, Jacques A.; Jacquart, Christian A.; and Marijon, Jean-Louis H., 3,975,588.

Marine Colloids, Inc.: *See*—
Renn, Donald W., 3,975,162.

Mark, Viggo; and Sikich, Matthew John. Tilting ramp assembly for fishing vessels. 3,974,923, Cl. 214-15.00R.

Markfelder, Gunter: *See*—
Hofmann, Heinrich; and Markfelder, Gunter, 3,975,066.

Markowski, Stanley J.; and Reilly, Richard S., to United Technologies Corporation. Turbofan engine with augmented combustion chamber using vorbix principle. 3,974,646, Cl. 60-39.650.

Marquette, Leo Jude: *See*—
Brock, Bill M., Jr.; Marquette, Leo Jude; and Nelson, Norman Allen, 3,974,690.

Marsch, James E.: *See*—
Breed, Michal A.; and Marsch, James E., 3,974,717.

Marshall, William Wilfred: *See*—
May, Frank Herbert; and Marshall, William Wilfred, 3,974,889.

Marston, Harvey J. Telephone line splicing apparatus. 3,975,600, Cl. 179-175.30A.

Martens, Henry J.; and Vandebult, Jan, to I. D. Engineering, Inc. Anti-theft fastening device and tool for releasing same. 3,974,581, Cl. 40-20.00R.

Martin, Frank J.; and Holbrook, Rex R., to Chrysler Corporation. Vacuum delay valve. 3,975,609, Cl. 219-69.00M.

Martin, Jacques Lucien Joseph, to R.K.S. Bearing assemblies. 3,975,067, Cl. 308-216.000.

Martin, Roger, to United Kingdom Atomic Energy Authority. Ultrasonic apparatus for determining the volume of bubbles in liquid. 3,974,683, Cl. 73-432.0PS.

Martz, Lyle F.; and Plotnick, Richard J., to Westinghouse Electric Corporation. Combined cycle electric power plant and heat recovery steam generator having improved multi-loop temperature control of the steam generated. 3,974,644, Cl. 60-39.18B.

Maruo, Keiichi: *See*—
Watanabe, Shiro; Maruo, Keiichi; and Ono, Hiroshi, 3,975,181.

Marvin Glass & Associates: *See*—
Barlow, Gordon A., 3,975,019.

Maschinenfabrik Goebel, GmbH: *See*—
Kroppenstedt, Dietmar, 3,974,948.

Masoero, Marcella: *See*—
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, 3,975,180.

Mason, John Richard, to Dracon Industries. Unitary offset wall plug. 3,975,075, Cl. 339-102.00R.

Mastro, Alex Anthony: *See*—
Boyle, Robert John; Rucker, Howard Lewis; Mastro, Alex Anthony; and Jackson, Thomas Peter, 3,975,026.

Masuda, Hiroshi, to Central Glass Co., Ltd. System for preventing cracking of glass ribbon in plate manufacturing. 3,975,177, Cl. 65-158.000.

Matson, Rapheal Fritz, to Freeport Minerals Company. Oxidation-resistant nickel and cobalt sulfides and method for preparing same. 3,975,507, Cl. 423-561.000.

Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, to Nippon Steel Corporation. Horizontal rectilinear type metal-electroplating method. 3,975,242, Cl. 208-28.000.

Matsuda, Yoshio, to Yoshida Kogyo Kabushiki Kaisha. Warp-knitted tape for slide fastener. 3,974,549, Cl. 24-205.10C.

Matsuda, Yoshio: *See*—
Fujisaki, Yoshinori; Matsuda, Yoshio; and Tsubokawa, Yoshitoki, 3,974,550.

Matsuguma, Yoshihiko: *See*—
Ono, Tomoyoshi; and Matsuguma, Yoshihiko, 3,975,570.

Matsui, Katsuaki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda,

Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Matsui, Noriyoshi: *See*—
Kita, Edward Kiyoshi; and Matsui, Noriyoshi, 3,974,762.

Matsuki, Takeshi: *See*—
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Matsumoto, Keishin, Director-General, Agency of Industrial Science and Technology: *See*—
Takei, Akira, 3,975,647.

Matsuo, Yoshihiro; Fujimura, Masanori; Matsuoka, Tomizo; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. PTC thermistor composition and method of making the same. 3,975,307, Cl. 252-520.000.

Matsuoka, Tomizo: *See*—
Matsuo, Yoshihiro; Fujimura, Masanori; Matsuoka, Tomizo; and Hayakawa, Shigeru, 3,975,307.

Matsushima, Haruo: *See*—
Tanaka, Junzo; Matsushima, Haruo; and Hatagawa, Toyotsugu, 3,975,606.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ikedo, Masaru; Yasuno, Yoshitake; and Yamashita, Tadaoki, 3,975,637.
Kato, Makota; Kamisaka, Kosey; and Okino, Yoshihiro, 3,975,081.
Kobayashi, Fukashi; Taniguchi, Hiroshi; and Kanai, Kenji, 3,975,764.
Matsuo, Yoshihiro; Fujimura, Masanori; Matsuoka, Tomizo; and Hayakawa, Shigeru, 3,975,307.
Obata, Shuichi; Kagata, Akira; Morita, Katsuhiko; Kubo, Masatoyo; and Itoh, Masashi, 3,975,025.
Shida, Sankichi; Hashimoto, Koji; Hirohata, Hyogo; and Honjo, Katsuhiko, 3,975,076.
Tanaka, Junzo; Matsushima, Haruo; and Hatagawa, Toyotsugu, 3,975,606.
Taniguchi, Hiroshi; and Arimura, Ichiro, 3,975,759.

Mattei, Silvano: *See*—
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, 3,975,607.

Mattheij, Mathieu Martinus Maria Petrus: *See*—
Van Esdonk, Johannes; Hornman, Johannes Petrus; Bluekens, Antonius Matheus Johanna; and Mattheij, Mathieu Martinus Maria Petrus, 3,974,583.

Matthews, Merton Louis, to Maxson Automatic Machinery Company. Overlapped sheet-feeding machine. 3,975,012, Cl. 271-183.000.

Matty, Thomas C., to Westinghouse Electric Corporation. Vehicle velocity limit control method and apparatus. 3,974,992, Cl. 246-182.00B.

Matusek, Edward J. Rotary sunroof for an automotive vehicle. 3,975,048, Cl. 296-137.00B.

Matzkin, Leonid Arkadjevich: *See*—
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Maxson Automatic Machinery Company: *See*—
Matthews, Merton Louis, 3,975,012.

May, Frank Herbert; and Marshall, William Wilfred, to Saunders Transport Limited. Axle weighing of road vehicles. 3,974,889, Cl. 177-134.000.

Mayer, Hans Johann; Fischli, Albert Eduard; Klaus, Michael Josef; and Wick, Alexander Eduard. Hexahydro-5-oxy-2-loweralkoxy-2H-cyclopenta[b]-furan-4-carbonitrile intermediates for prostaglandins. 3,975,406, Cl. 260-346.20R.

Mayer, Hans Johann: *See*—
Kienzle, Frank; and Mayer, Hans Johann, 3,975,445.

Mayer, Hans Rolf Jakob; Langecker, Gerhard; and Gebauer, Hans-Jurgen, to Josef Meissner, Firma. Reprocessing of final acid from nitroglycerine production. 3,975,452, Cl. 260-645.000.

Mayfield, Glenn A., to Esterline Corporation. Watt/watthour transducer and integrator and current sources therefor. 3,975,682, Cl. 324-142.000.

Mazdiyasni, Khodabakhsh S.; and Schaper, Barbara J., to United States of America, Air Force. Preparation of yttrium and lanthanide hexafluoroisopropoxide diammoniates. 3,975,416, Cl. 260-429.200.

Mazur, Robert H., to G. D. Searle & Co. Inhibitory octapeptides angiotensin II. 3,975,365, Cl. 260-112.50R.

McAllister, Patrick R.: *See*—
Mahler, Eddie G.; McAllister, Patrick R.; and Wilhoit, Eugene D., 3,975,502.

McBride, Leonard M.: *See*—
Domaracki, John F.; McBride, Leonard M.; and Wack, Frank, 3,974,928.

McCabe, John M.: *See*—
Yoerger, William E.; McCabe, John M.; and Wright, John F., 3,975,352.

McCall, William S.; and Pray, Lester W., to Platt Saco Lowell Corporation. Resilient mounting means for a traveler cleaner. 3,974,634, Cl. 57-57.000.

McCann, John: *See*—
Bagshaw, Trevor; and McCann, John, 3,975,610.

McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., to Dow Chemical Company, The. 1-(2,4-Dimethoxy-phenyl)-3-(2-hydroxyethyl)thiourea. 3,975,433, Cl. 260-552.00R.

McClean Anderson, Inc.: *See*—
McClean, William George, 3,975,479.

McClean, William George, to McClean Anderson, Inc. Method of fabricating a reinforced plastic article. 3,975,479, Cl. 264-102.000.

McClellan, Donald. Automatic dump truck cover. 3,975,047, Cl. 296-100.000.

McCoy, Frederic C.: *See*—
Schlicht, Raymond C.; and McCoy, Frederic C., 3,975,387.

McCulloch Corporation: *See*—
Pilatowicz, Edward J., 3,974,566.

McCullough, John F.; and Frederick, Leland L., to Tennessee Valley Authority. Purification of wet-process phosphoric acid with methanol and ammonia. 3,975,178, Cl. 71-34.000.

McCullough, Lester E.; and Taylor, Richard E. Discharge pipe line locator. 3,975,735, Cl. 343-112.00R.

McCullough, Robert E.: *See*—
Bergey, John M.; McCullough, Robert E.; and O'Connor, Arthur H., 3,974,637.

McDermott, Julian A. Overvoltage protector for battery operated devices. 3,975,670, Cl. 320-13.000.

McEuen, Robert B. Geothermal exploration method utilizing electrical resistivity and seismic velocity. 3,975,674, Cl. 324-1 000.

McEvoy Oilfield Equipment Co.: *See*—
Herd, David P.; and Fowler, John H., 3,974,875.

McGinniss, Vincent D., to SCM Corporation. Cathodic electrocoating process. 3,975,251, Cl. 204-181.000.

McHard, James A.: *See*—
Bennett, Donald R.; and McHard, James A., 3,975,521.

McKee, Dale P. Tilting swivel chair support. 3,975,050, Cl. 297-328.000.

McKenzie, Girard J. Loader and tree remover. 3,974,925, Cl. 214-147.00G.

McLaughlin, Emmett J., to Westinghouse Electric Corporation. Fluorescent lampholder with means for circuit interruption. 3,975,073, Cl. 339-53.000.

McLean, Robert F.; and Hofer, Peter H., to John Z. DeLorean Corporation. Method to produce 3-dimensional matrix surface. 3,975,492, Cl. 264-263.000.

McMahon, Donald H., to Sperry Rand Corporation. Real time fingerprint recording terminal. 3,975,711, Cl. 340-146.30E.

McNabb, David Franklin: *See*—
Russell, Lionel E.; and McNabb, David Franklin, 3,974,629.

McNabney, John C., to Trane Company, The. Air distribution regulator apparatus. 3,974,859, Cl. 137-625.370.

McNeil, Thomas Karl, to United States Steel Corporation. System for detecting faults along an electric overhead traveling crane runway. 3,974,689, Cl. 73-146.000.

McPherson, John Andrew: *See*—
Emblem, Harold Garton; and McPherson, John Andrew, 3,975,202.

McWhorter, Delmer L. Self securing theft proof chain binder. 3,974,668, Cl. 70-14.000.

Meadows, Talmadge W., to First National Bank of Decatur, Alabama. Emergency civil defense alarm and communications systems. 3,975,583, Cl. 178-5.600.

Means, Rodney J.: *See*—
Hepworth, Edward C.; Means, Rodney J.; and Peddle, Charles I., 3,975,712.

Medtronic, Inc.: *See*—
Kane, Lawrence M., 3,974,834.

Meetze, Murray O., Jr. Method and apparatus for studying laboratory animal behavior. 3,974,798, Cl. 119-1.000.

Mego, Alexander, Jr.; and Feichtner, John D., to Westinghouse Electric Corporation. Control of laser output characteristics by fluid streams. 3,975,692, Cl. 331-94.50M.

Mehrhof, Werner: *See*—
Gante, Joachim; Mehrhof, Werner; and Wild, Albrecht, 3,975,403.

Meiel, Samuel P.; and Sherry, Cameron W., to Domtar Limited. Easily dismantled partition structure. 3,974,548, Cl. 24-204.000.

Meier, Jurgen-Dietrich: *See*—
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,975,534.

Meiji Seika Kaisha, Ltd.: *See*—
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.

Meili, Ernst: *See*—
Knobel, Fritz; and Meili, Ernst, 3,975,660.

Melamed, Nathan T.; and Steinbruegge, Kenneth B., to Westinghouse Electric Corporation. Self Q-switched laser. 3,975,694, Cl. 331-94.50Q.

Melton, Rosser B., Jr.; and Hubbard, Elbert M., to Southwest Research Institute. System for injecting particulate material into the combustion chamber of a repetitive combustion coating apparatus. 3,974,939, Cl. 222-1.000.

Mendenhall, Robert L. Process and apparatus for recycle of asphalt-aggregate compositions. 3,975,002, Cl. 259-148.000.

Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; and Danneberg, Peter, to Boehringer Ingelheim GmbH. N-[4'-Imidazolidinon-(2)-yl-phenethyl]-N'-pyridyl-piperazines and salts thereof. 3,975,525, Cl. 424-250.000.

Mercer, Roger W. Cast ejector. 3,975,489, Cl. 264-222.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Gante, Joachim; Mehrhof, Werner; and Wild, Albrecht, 3,975,403.
Merenda, Pierre; and Reymond, Jean Claude, to Thomson-CSF. Lamp with an integrated flasher device. 3,975,659, Cl. 315-72.000.
Merz, Herbert: *See—*
Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, 3,975,368.
Mesek, Frederick K., to Johnson & Johnson. Method of forming a fibrous web. 3,975,222, Cl. 156-62.200.
Messer, Mayer Naoum: *See—*
Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, 3,975,385.
Meszaros, Csilla: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,975,390.
Mettler, Leo L. Automated aerosol mist dispenser. 3,974,941, Cl. 222-70.000.
Metzger, Karl-Georg: *See—*
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,975,375.
Meyer, Elwyn A., to Emerson Electric Co. Rotary differential ammunition reservoir. 3,974,738, Cl. 89-34.000.
Meyer, Engelbert A., to USM Corporation. Friction-grip clip releasably encompasses rod. 3,975,008, Cl. 267-181.000.
Michaut, Claude: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.
Michel, Friedbert: *See—*
Stumpp, Gerhard; Michel, Friedbert; and Steiner, Josef, 3,974,811.
Microlife Technics, Inc.: *See—*
Vedamuthu, Ebenezer R., 3,975,545.
Mieuli, Jack, Jr. Basic foundation for floral arrangements. 3,974,915, Cl. 206-423.000.
Mifune, Tadayoshi: *See—*
Yamanaka, Seisuke; Kanou, Yasuo; Mifune, Tadayoshi; and Shimada, Satoshi, 3,975,760.
Mikelsons, Valdis, to Minnesota Mining and Manufacturing Company. Coated aluminum substrates. 3,975,197, Cl. 96-86.00R.
Miles, Leslie John. Gripping device. 3,975,043, Cl. 294-25.000.
Miller, Alfred D., to ICI United States Inc. Hexahydro-1H-furo(3,4-c) pyrrole compounds for treating pain. 3,975,532, Cl. 424-274.000.
Miller, David J.: *See—*
Wiewiorowski, Tadeusz K.; and Miller, David J., 3,975,497.
Miller, Galen R., to Chemidyne Corporation. Method and applicator for producing cleaning foam. 3,974,965, Cl. 239-413.000.
Miller, John Alois: *See—*
Allen, Marvin Martin; Miller, John Alois; and Woodings, Bruce Edward, 3,975,219.
Miller, Robert C.: *See—*
Emtage, Peter R.; Nalepa, Philip J.; and Miller, Robert C., 3,975,658.
Milton Roy Company: *See—*
Bohl, Thomas L.; Goodnight, Lyman E., Jr.; Ruble, Herschel C.; and Wells, John H., 3,975,160.
Mina, George Louis; and Erjavec, John, to American Cyanamid Company. Process for 2-mercaptobenzothiazole. 3,975,394, Cl. 260-306.000.
Minerec Corporation: *See—*
Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, 3,975,264.
Minko, Anthony S. Cartridge shell reloading tool. 3,974,736, Cl. 86-23.000.
Minnesota Mining and Manufacturing Company: *See—*
Bent, John H.; and Russo, Anthony, 3,975,032.
Franer, Victor R.; and Burman, Darrell C., 3,975,563.
Mikelsons, Valdis, 3,975,197.
Minogue, Robert W.; and Troyer, Lloyd E., to LET-R-EDGE Of Canada Ltd. Apparatus for constructing three-dimensional sign character. 3,974,552, Cl. 29-33.00S.
Minolta Camera Kabushiki Kaisha: *See—*
Beppu, Norio, 3,975,746.
Minoura, Kazuo; and Hirabayashi, Yoichi, to Canon Kabushiki Kaisha. Catoptric projection system with a spherical reflecting surface. 3,975,095, Cl. 353-69.000.
Minto, Wallace Louis, to Sarasota Instruments Inc. Testing apparatus which measures index of refraction. 3,975,097, Cl. 356-30.000.
Mirto, Matthew, Jr., to W. S. Rockwell Company. Self-regulating tide gate. 3,974,654, Cl. 61-17.000.
Mita, Masazo; and Nagatomo, Masatsugu, to Kabushiki Kaisha Komatsu Seisakusho. Steering brake system for use in track-type vehicles. 3,974,899, Cl. 192-3.00M.
Mitchell, Harry R.; Rice, Hal H.; and Abel, James R., to General Motors Corporation. Exhaust reactor manifold. 3,974,650, Cl. 60-282.000.
Mitchell, John R. Plastic trash bag tie bands. 3,974,960, Cl. 229-62.000.
Mitchell, Terence G.; and Pritchard, John A., to Brown & Williamson Tobacco Corporation. Smoking materials. 3,974,838, Cl. 131-17.00R.
Mitsubishi Chemical Industries Ltd.: *See—*
Yamawaki, Takeshi; Hayashi, Masahiro; and Endo, Kazuo, 3,975,461.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kawakami, Takeshi; Tani, Tsutomu; Ishikawa, Takatoshi; and Hirabayashi, Syoji, 3,975,653.
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Miyazaki, Kazuhide; and Abe, Kiyomi, 3,975,498.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Sameshima, Muneyasu; Osawa, Tagui; and Hirai, Utaka, 3,975,411.
Mitsuyoshi Hamasu: *See—*
Ecchuya, Masao, 3,974,532.
Miyano, Tetsuji: *See—*
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,975,366.
Miyazaki, Kazuhide; and Abe, Kiyomi, to Mitsui Mining & Smelting Co., Ltd. Process for adsorbing and removing nitrogen oxides from waste gases. 3,975,498, Cl. 423-239.000.
Miyazawa, Yoshihide: *See—*
Ohnishi, Yoshitake; Ozutsumi, Minoru; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,975,285.
Miyazono, Toshitake: *See—*
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, 3,975,242.
Mizukami, Etsuo: *See—*
Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,975,661.
Mizutani, Kunihiko; Aoyama, Takami; and Kawamura, Kazuhiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal assembly for rotary engine. 3,975,125, Cl. 418-142.000.
MM Systems Corporation: *See—*
Attaway, Julian J., 3,974,609.
Mobil Oil Corporation: *See—*
Burress, George T., 3,975,300.
Florian, John, 3,974,722.
Molina, Orlando G., to Rockwell International Corporation. Water washable dye penetrant composition and method utilizing same. 3,975,634, Cl. 250-302.000.
Moline, Donald F., to Goodyear Tire & Rubber Company, The. Process of preparing free-flowing antiozonant blends. 3,975,297, Cl. 252-400.00R.
Molins Machine Company, Inc.: *See—*
Grobman, William, 3,974,768.
Molitor, Victor D. Method of installing the coping and gutter of a rim flow swimming pool. 3,975,477, Cl. 264-35.000.
Moller, Thomas G., to American Flange & Manufacturing Co., Inc. Bottle cap. 3,974,931, Cl. 215-254.000.
Molnar, James R.: *See—*
Cross, Christopher G.; Kirk, Charles E.; and Molnar, James R., 3,974,914.
Molyneux Engineering Company Limited: *See—*
Molyneux, George; and Molyneux, George Walter, 3,975,107.
Molyneux, George; and Molyneux, George Walter, to Molyneux Engineering Company Limited. Anchorage studs. 3,975,107, Cl. 403-271.000.
Molyneux, George Walter: *See—*
Molyneux, George; and Molyneux, George Walter, 3,975,107.
Monier, Jean-Claude: *See—*
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 3,975,434.
Monne, Maxime. Rolling element for a handling equipment and equipments comprising such elements. 3,974,777, Cl. 104-94.000.
Monsanto Company: *See—*
Boyer, Ronald J.; Stenseth, Raymond E.; and Sheehan, Richard J., 3,975,408.
Leonard, Richard L., 3,975,478.
Wygant, James C., 3,975,278.
Montalenti, Paolo: *See—*
della Porta, Paolo; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,975,304.
Montalto, Michael S.: *See—*
Swanke, Thaddeus; Montalto, Michael S.; and Morse, John E., 3,974,952.
Montecatini Edison S.p.A.: *See—*
Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, 3,975,458.
Montedison S.p.A.: *See—*
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, 3,975,180.
Montenare, Anthony. Pneumatic cycle bumper. 3,975,042, Cl. 293-61.000.
Montgomery, Gary Van, to Sunbeam Plastics Corporation. Child resistant closure. 3,974,929, Cl. 215-216.000.
Montillier, Jean-Pierre, to Pitney-Bowes, Inc. Photoconductive charge transfer complex for electrophotography. 3,975,196, Cl. 96-1.500.
Moore, James D.: *See—*
Ryan, John W.; and Moore, James D., 3,975,014.
Moore, Robert R.; and Eitzen, Vincent E., to American Hospital Supply Corporation. Apparatus for mixing fluids held in tubes. 3,975,001, Cl. 259-72.000.

Moorey, Ernest J., to Western Industries (Proprietary) Ltd. Method of an apparatus for detecting ground faults in electrical systems. 3,975,663, Cl. 317-18.00R.

Moran, Henry Wayne: *See—*
Welstead, William John, Jr.; and Moran, Henry Wayne, 3,975,531.

Morandi, Dino: *See—*
Vinci, Fernando; and Morandi, Dino, 3,974,663.

Morar, Michael A., to Raymond Lee Organization, Inc., The, a part interest. Automobile anti-theft alarm system. 3,975,645, Cl. 307-10.0AT.

Mordan, William J., to Hewlett-Packard Company. Sweep generator apparatus and method. 3,975,684, Cl. 324-185.000.

Morgan Construction Company: *See—*
Hill, William J., 3,974,761.

Mori, Eiko: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Mori, Fumio: *See—*
Kondo, Kiyosi; and Mori, Fumio, 3,975,381.

Morikawa, Takashi; Kihara, Hidetoshi; Urifu, Tohru; and Takahashi, Hisateru, to Daiwa Boseki Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Feed roller for feeding fibers to a combing roller in an open end spinning machine. 3,974,635, Cl. 57-58.950.

Morimura, Syoji: *See—*
Murayama, Keisuke; Morimura, Syoji; and Yoshioka, Takao, 3,975,357.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Morita, Katsuhiko: *See—*
Obata, Shuichi; Kagata, Akira; Morita, Katsuhiko; Kubo, Masatoyo; and Itoh, Masashi, 3,975,025.

Morris, Harold D.; and Sigworth, Frederick J., to Systron Donner Corporation. Angular position sensing and control system, apparatus and method. 3,974,699, Cl. 73-432.00R.

Morrison, Roderick G., to Idaho Industrial Instruments, Inc. (Entire). Low level snow precipitation gauge. 3,975,641, Cl. 250-393.000.

Morse, John E.: *See—*
Swanke, Thaddeus; Montalto, Michael S.; and Morse, John E., 3,974,952.

Morton, Robert D., to Hartford Special Machinery Company, The. Adjustable track cover positioning assembly. 3,974,904, Cl. 193-38.000.

Moser, Kenneth B.: *See—*
Lotzgesell, James A.; Moser, Kenneth B.; and Hurst, Thomas L., 3,975,206.

Motani, Shigeru: *See—*
Tsubota, Katsuya; Motani, Shigeru; Hasue, Tatsuo; and Nijima, Yasuhiro, 3,975,338.

Motch & Merryweather Machinery Company, The: *See—*
Hurd, Stanley E., 3,975,057.

Motor Coach Industries Limited: *See—*
Niessner, Adam, 3,975,049.

Motorola, Inc.: *See—*
Hepworth, Edward C.; Means, Rodney J.; and Peddle, Charles I., 3,975,712.

Motosacoche S.A.: *See—*
Curtil, Remi, 3,974,804.

Mounts, Lewis S.: *See—*
Tigner, Reuben A.; and Mounts, Lewis S., 3,975,493.

Mrowca, Joseph John: *See—*
Knoth, Walter Henry, Jr.; and Mrowca, Joseph John, 3,975,447.

MTS Systems Corporation: *See—*
Petersen, Paul S., 3,974,949.

Muacevic, Gojko: *See—*
Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, 3,975,539.

Mueller, Charles William; and Douglas, Edward Curtis, to RCA Corporation. Method of making a bipolar transistor. 3,974,560, Cl. 29-590.000.

Mukai, Hideo; Yamaguchi, Toshiaki; and Yoshida, Tsuneo, to Nishimura Seisakusho Co., Ltd. Apparatus for suppressing rotational fluctuation of supply roll. 3,974,976, Cl. 242-75.500.

Muller, Anton; and Konig, Hubert, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Anti-skid tire chain. 3,974,871, Cl. 152-220.000.

Muller, Erich: *See—*
Narr, Berthold; Roch, Josef; Muller, Erich; and Haarmann, Walter, 3,975,384.
Nickl, Josef; Muller, Erich; Schroter, Wolfgang; Haarmann, Walter; and Roch, Josef, 3,975,524.

Muller, Erwin: *See—*
Blahak, Johannes; Muller, Erwin; and Richert, Karl Hartwig, 3,975,428.

Muller, Karl-Heinz: *See—*
Dworak, Wilhelm; and Muller, Karl-Heinz, 3,975,124.

Multuloc Corporation: *See—*
Grearson, Kenneth R., 3,974,608.

Mulvaney, William P., to Union Carbide Corporation. Process for production of cellular thermoplastic bodies. 3,975,473, Cl. 264-23.000.

Munir, Mohammad; Schiweck, Hubert; Weinz, Hans-Werner; and Wurm, Fritz, to Suddeutsche Zucker-Aktiengesellschaft. Process for working up molasses. 3,975,205, Cl. 127-46.00A.

Munk, Benedikt A.: *See—*
Pelton, Edward L.; and Munk, Benedikt A., 3,975,738.

Munk, Edmund; and Haas, Herbert, to Furnier-Und Sperrholzwerk J. F. Werz, Jr. KG Werzalit-Pressholzwerk. Apparatus for making shaped articles. 3,975,127, Cl. 425-193.000.

Munk, Miner N., to Varian Associates. Convergent light illuminated flow cell for liquid chromatography. 3,975,104, Cl. 356-246.000.

Munk, William D.: *See—*
Eberle, Arthur C.; Venendaal, Robert G.; and Munk, William D., 3,974,694.

Murakami, Katsuhiko; Ikeda, Tetsuo; Takeda, Masahiro; Kazama, Osamu; and Nishinaka, Hidaka, to Kabushiki Kaisha Ishida Koki Seisakusyo. Method of weighing and apparatus therefor. 3,974,888, Cl. 177-52.000.

Murata, Masahiro, to Hope Kabushiki Kaisha. Ski bindings. 3,975,035, Cl. 280-621.000.

Murayama, Keisuke; Morimura, Syoji; and Yoshioka, Takao, to Sankyo Company Limited. Stabilized synthetic polymer compositions. 3,975,357, Cl. 260-45.80N.

Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, to Sankyo Company Limited. Piperidine-spiro-hydantoin derivatives and their use as stabilizers. 3,975,462, Cl. 260-880.00R.

Murphy, Patrick N. Emergency brake unit. 3,974,895, Cl. 188-76.000.

Murray, Gerald J., Jr.; and Klingenberg, Gordon U., to Xerox Corporation. Dual mode apparatus for developing latent electrostatic images. 3,974,796, Cl. 118-4.000.

Musall, Reimar: *See—*
Hauschild, Ulrich; Musall, Reimar; and Schroder, Hans-Jurgen, 3,975,503.

Myles, Thomas A.; and Zimmer, Curtis E., to Carborundum Company, The. Preparation of pyrophosphates. 3,975,308, Cl. 252-520.000.

Nagano, Masashi, to Shimano Industrial Company, Limited. Derailleur for a bicycle. 3,974,707, Cl. 74-217.00B.

Nagano, Masayoshi: *See—*
Kamikado, Toshiya; Kuragano, Takashi; Konishi, Kazuo; Sato, Yasuo; and Nagano, Masayoshi, 3,975,538.

Nagatomo, Masatsugu: *See—*
Mita, Masazo; and Nagatomo, Masatsugu, 3,974,899.

Nagumo, Shin-Ichi: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-Ichi, 3,974,651.

Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tanimura, Kaoru; and Tamada, Shigeharu, to Otsuka Pharmaceutical Company Limited. 5-[1-Hydroxy-2-(substituted-amino)]ethyl-8-hydroxy-3,4-dihydrocarbostyril derivatives. 3,975,391, Cl. 260-288.00R.

Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-Ichi, to Nissan Motor Co., Ltd. Afterburning control of internal combustion engine exhaust gas. 3,974,651, Cl. 60-290.000.

Nakano, Shinya: *See—*
Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, 3,974,617.

Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; Kawada, Yasuzi; and Okamura, Hisanori, to Hitachi, Ltd. Welding method for dissimilar metals. 3,975,612, Cl. 219-121.0EM.

Nalco Chemical Company: *See—*
Flynn, Gardner, 3,974,783.
Gross, Anthony E.; and Connelly, Larry J., 3,975,183.
Gross, Anthony E., 3,975,185.
Phillips, K. G.; and Zarnecki, W. E., 3,975,347.
Tai, Wun Ten; and Phillips, Kenneth G., 3,975,305.

Nalepa, Philip J.: *See—*
Emtage, Peter R.; Nalepa, Philip J.; and Miller, Robert C., 3,975,658.

Namery, Jerry. Ultrasonic bubble detector. 3,974,681, Cl. 73-67.50R.

Narr, Berthold; Roch, Josef; Muller, Erich; and Haarmann, Walter, to Boehringer Ingelheim GmbH. 2,4,5,6-Tetrasubstituted pyrimidines and salts thereof. 3,975,384, Cl. 260-243.00R.

Nasser, Karim W., to Canadian Patents and Development Limited. Accelerated concrete strength testing. 3,974,679, Cl. 73-15.600.

Nathanson, Harvey C.: *See—*
Green, David; Nathanson, Harvey C.; and Malmberg, Paul R., 3,975,598.

Natico, Inc.: *See—*
Repenning, William, 3,975,134.

National Convenience Stores: *See—*
Stangroom, Max, 3,975,552.

National Semiconductor Corporation: *See—*
Sporck, Christian R., 3,975,757.

National Starch and Chemical Corporation: *See—*
Georgoudis, Paul C.; Schoenberg, Jules E.; Ray-Chaudhuri, Dilip K.; and Puletti, Paul P., 3,975,323.

National Union Electric Corporation: *See—*
Zellhoefer, Glenn F., 3,975,209.

Nauterra S.A.: *See—*
Guanzini, Aldo, 3,974,535.

Nayar, Harbhajan S., to Airco, Inc. Powder metallurgy process for producing stainless steel stock. 3,975,193, Cl. 75-211.000.

Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, to Beecham Group Limited. 3-Benzyl-7-triphenylmethylamino-3-cephem-4-carboxylic acid and salts and esters thereof. 3,975,383, Cl. 260-243.00C.

NCR Corporation: *See—*
Kibler, Alfred G., 3,974,951.
Saluke, William M., 3,975,574.

Necchi S.p.A.: *See*—
Bianchi, Nereo, 3,974,786.
Nelson, Bascom: *See*—
Pohl, Robert; and Nelson, Bascom, 3,974,602.
Nelson, George R., Jr.; and Kaplan, Herman, to Grumman Aerospace Corporation. Method and apparatus for delivering constant water flow rates to a fire hose at each of a plurality of selectable flow rate settings. 3,974,879, Cl. 169-43.000.
Nelson, Norman Allen: *See*—
Brock, Bill M., Jr.; Marquette, Leo Jude; and Nelson, Norman Allen, 3,974,690.
Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. 2-Substituted-5-oxo-5H-dibenzo(a,d)cycloheptenes, and derivatives thereof, and methods and compositions for the use thereof. 3,975,540, Cl. 424-315.000.
Nelson, Richard L., to Exxon Research and Engineering Company. Facsimile copy medium magazine. 3,975,590, Cl. 178-5.000.
Neri, Carlo; and Perrotti, Emilio, to Snam Progetti S.p.A. Process for the preparation of alkylsulphonate compounds. 3,975,430, Cl. 260-513.00B.
Neumann, Arthur E.: *See*—
Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., 3,974,964.
Neumeier, Gunter F.: *See*—
Berube, James E.; and Neumeier, Gunter F., 3,975,595.
Newport, Harry E., Jr.: *See*—
Baysinger, Robert L.; and Newport, Harry E., Jr., 3,975,136.
Newton, John W.; and Helt, Wilson G., to Westinghouse Electric Corporation. Direct view storage tube. 3,975,656, Cl. 313-397.000.
Nickl, Josef; Muller, Erich; Schroter, Wolfgang; Haarmann, Walter; and Roch, Josef, to Boehringer Ingelheim GmbH. 3-Piperazino-isoquinolines and salts thereof. 3,975,524, Cl. 424-246.000.
Nicolay, Hugh Crawford, to Harris Corporation. Junction field effect transistor. 3,975,752, Cl. 357-22.000.
Nielsen, Ove Hjortborg, to A/S Dansk Metal- & Armaturindustri. Regulation valves. 3,974,858, Cl. 137-606.000.
Nierman, Albert J., to Chevron Research Company. Transportation of natural gas as a hydrate. 3,975,167, Cl. 48-190.000.
Niessner, Adam, to Motor Coach Industries Limited. Emergency escape hatch assembly for vehicles. 3,975,049, Cl. 296-137.00B.
Niida, Taro: *See*—
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.
Nijima, Yasuhiro: *See*—
Tsubota, Katsuya; Motani, Shigeru; Hasue, Tatsuo; and Nijima, Yasuhiro, 3,975,338.
Nikawitz, Edward J., to Givaudan Corporation. Substituted cinnamanilides. 3,975,435, Cl. 260-558.00P.
Niles Parts Co., Ltd.: *See*—
Uda, Toshio, 3,975,619.
Nilsson, Sven Walter, to SKF Nova AB. Ball bushing. 3,975,064, Cl. 308-6.00C.
Nintz, Eckhard; Schick, Rupert; Horacek, Heinrich; and Stahnecker, Erhard, to BASF Aktiengesellschaft. Particulate, expandable self-extinguishing styrene polymers showing good processability. 3,975,327, Cl. 260-2.50B.
Nippon Electric Company, Ltd.: *See*—
Ohnishi, Yoshitake; Ozutsumi, Minoru; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,975,285.
Tan, Yoichi; and Hashimoto, Hiromi, 3,975,687.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Koike, Masahiko, 3,974,729.
Nippon Kogaku K.K.: *See*—
Toyoda, Kenji, 3,975,747.
Nippon Kokan Kabushiki Kaisha: *See*—
Kawawa, Takaho; Arimura, Tohru; and Okado, Masaru, 3,974,559.
Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 3,974,818.
Nippon Steel Corporation: *See*—
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, 3,975,242.
Nippon Telegraph and Telephone Public Corporation: *See*—
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.
Nishida, Takashi: *See*—
Fujita, Yoshiji; Nishida, Takashi; and Itoi, Kazuo, 3,975,451.
Nishikawa, Tatsuo, to Ricoh Co., Ltd. Back tension imparting device. 3,974,974, Cl. 242-55.000.
Nishikawa, Tatsuo: *See*—
Ito, Matsutoshi; Nishikawa, Tatsuo; and Takeshita, Kano, 3,975,707.
Nishimura Seisakusho Co., Ltd.: *See*—
Mukai, Hideo; Yamaguchi, Toshiaki; and Yoshida, Tsuneo, 3,974,976.
Nishimura, Takumi: *See*—
Kondo, Toshiyuki; and Nishimura, Takumi, 3,975,061.
Nishinaka, Hidaka: *See*—
Murakami, Katsuhiko; Ikeda, Tetsuo; Takeda, Masahiro; Kazama, Osamu; and Nishinaka, Hidaka, 3,974,888.
Nishizawa, Edward E.: *See*—
Lednicer, Daniel; and Nishizawa, Edward E., 3,975,371.
Nissan Motor Co., Ltd.: *See*—
Iijima, Tetsuya, 3,974,720.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-Ichi, 3,974,651.
Nisshin Kogyo Kabushiki Kaisha: *See*—
Hirayama, Itaru, 3,975,060.
Nitro-Nobel A.B.: *See*—
Pierrou, Rune Helmer, 3,975,277.
Nitto Electric Industrial Co., Ltd.: *See*—
Suzuki, Yasuhiro; and Yamaguchi, Katsuhiko, 3,975,330.
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased (by Saito, Nobuko, heir); and Niida, Taro, to Meiji Seika Kaisha, Ltd. Process for the production of cephamycin type antibiotic substances. 3,975,235, Cl. 195-29.000.
NL Industries, Inc.: *See*—
Braithwaite, David G.; and Hettinger, William P., Jr., 3,975,283.
Mahotka, Hans; and Glastetter, Manfred, 3,975,063.
Noble, James. Snowmobile suspension. 3,974,890, Cl. 180-5.00R.
Noble, Peter M.; and Delvernois, Philip J., Jr., to Westinghouse Air Brake Company. Railway wheel squeal suppression arrangement. 3,974,963, Cl. 238-382.000.
Nogaj, Alfred: *See*—
Reinehr, Ulrich; Nogaj, Alfred; and Schmidt, Wolfhard, 3,975,337.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine. 3,974,818, Cl. 123-32.0SP.
Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gas labyrinth carburetor throttle shaft seal. 3,974,806, Cl. 123-119.00R.
Nohira, Hidetaka; and Tanaka, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control valve assembly for exhaust gas recirculation system. 3,974,807, Cl. 123-119.00A.
Nomiya, Kosei: *See*—
Kawagoe, Hiroto; and Nomiya, Kosei, 3,975,649.
Nommensen, Johan P., to Stamicarbon B.V. Process and device for filtering media. 3,975,274, Cl. 210-82.000.
Nomura, Tadayoshi: *See*—
Sugimatsu, Akihito; Yorozu, Makoto; Nomura, Tadayoshi; Yoshino, Isamu; and Yoshikawa, Hachiro, 3,975,569.
Norman, Scott L., to GTE Laboratories Incorporated. Portable holographic information retrieval system with an active screen. 3,975,080, Cl. 350-3.500.
Normann, Nils A., to Baylor College of Medicine. Remote electrical monitoring of gas activated blood pumps. 3,974,825, Cl. 128-1.00D.
Northern Electric Company Limited: *See*—
Springthorpe, Anthony John, 3,975,751.
Northrop Corporation: *See*—
Shorr, Melvin, 3,974,987.
Nussbaumer, Thomas, to Patent & Inventions Ltd. Closure mechanism for an injection molding machine or extrusion press. 3,975,133, Cl. 425-451.200.
N.V. Nederlandse Gasunie: *See*—
Van Baasbank, Pieter; Flendrig, Hubertus A.; and De Vries, Hilbert, 3,974,757.
Nylund, Kenneth G. Turquoise scrubber. 3,974,538, Cl. 15-21.00D.
Obata, Shuichi; Kagata, Akira; Morita, Katsuhiko; Kubo, Masatoyo; and Itoh, Masashi, to Matsushita Electric Industrial Co., Ltd. Pickup cartridge. 3,975,025, Cl. 274-37.000.
O'Brien, James Thomas: *See*—
Ladany, Ivan; Limm, Albert Chang; and O'Brien, James Thomas, 3,975,555.
O'Connor, Arthur H.: *See*—
Bergey, John M.; McCullough, Robert E.; and O'Connor, Arthur H., 3,974,637.
Odor, Louis: *See*—
Fosness, John P.; and Odor, Louis, 3,974,673.
Oertle, Donald H.: *See*—
Radd, Frederick J.; Wolfe, Louis H.; and Oertle, Donald H., 3,975,253.
Oestreich, James W.: *See*—
Campbell, John M.; and Oestreich, James W., 3,974,985.
Oettinger, Peter E.; and Bornhorst, Walter J. Tennis shoe toe cup. 3,974,578, Cl. 36-72.00R.
Ogawa, Yasuaki: *See*—
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.
Ogle, James A., to Burroughs Corporation. Display panel and system for operating the same. 3,975,725, Cl. 340-324.00M.
Ogles, Ethridge F. Centrifugal pump. 3,975,113, Cl. 415-180.000.
Oh, Chan S., to Beckman Instruments, Inc. Low voltage actuated field effect liquid crystals compositions and method of synthesis. 3,975,286, Cl. 252-299.000.
Ohi, Reiichi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Aryltetrazol-5-ylthio- and thioether-substituted hydroquinone compounds. 3,975,395, Cl. 260-308.00D.
Ohloff, Gunther: *See*—
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,975,310.
Ohmi, Atsushi, to Aisin Seiki Kabushiki Kaisha. Brake booster. 3,974,741, Cl. 91-376.00R.

Ohnishi, Yoshitake; Ozutsumi, Minoru; Miyazawa, Yoshihide; and Gonda, Michihiro, to Hodogaya Chemical Co., Ltd.; and Nippon Electric Company, Ltd. Liquid crystal composition. 3,975,285, Cl. 252-299.000.
Ohsawa, Hisayou: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou. 3,975,462.
Ohta, Noriyuki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Hizashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou. 3,975,462.
Oka, Joji: *See—*
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake. 3,975,242.
Okada, Masaru; and Inoue, Jun, to Sumitomo Metal Industries, Ltd. Vacuum degassing apparatus. 3,975,004, Cl. 266-210.000.
Okada, Reisuke; Okuno, Hiroshi; and Fukama, Toshio, to Toray Industries, Inc. Manufacture of crimped polyamide filaments yarn. 3,975,484, Cl. 264-168.000.
Okado, Masaru: *See—*
Kawawa, Takaho; Arimura, Tohru; and Okado, Masaru. 3,974,559.
Okamura, Hisanori: *See—*
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; Kawada, Yasuzi; and Okamura, Hisanori. 3,975,612.
Okino, Yoshihiro: *See—*
Kato, Makota; Kamisaka, Kosey; and Okino, Yoshihiro. 3,975,081.
Okuno, Hiroshi: *See—*
Okada, Reisuke; Okuno, Hiroshi; and Fukama, Toshio. 3,975,484.
Oldenburg, Bo Julius. Bottom for planing boats. 3,974,790, Cl. 114-66.50S.
Olin Corporation: *See—*
Kircher, Morton S., 3,975,255.
Olinkraft, Inc.: *See—*
Graser, Earl J., 3,974,911.
Olympia Werke AG: *See—*
Weber, Gerald; and Sorgenfrei, Jurgen. 3,975,714.
O'Meara, Thomas R., to Hughes Aircraft Company. Adaptive imaging telescope with linear sensing and electro-optical phase shifting. 3,975,629, Cl. 250-201.000.
Ono, Hiroshi: *See—*
Watanabe, Shiro; Maruo, Keiichi; and Ono, Hiroshi. 3,975,181.
Ono, Tomoyoshi; and Matsuguma, Yoshihiko, to Teijin Limited. Adhesive tapes having a pressure sensitive adhesive composition containing hydroxyethyl cellulose. 3,975,570, Cl. 428-355.000.
Onoda Cement Company, Ltd.: *See—*
Fukuda, Yoshiharu; and Ueda, Yoshihiko. 3,975,148.
Oozeki, Takashi: *See—*
Yamada, Tatsuya; Kawashima, Toshihide; and Oozeki, Takashi. 3,975,085.
Oppermann, Gunter: *See—*
Claussen, Uwe; and Oppermann, Gunter. 3,975,291.
Opravil, Egon, to Lumoprint Zindler KG. Electrophotographic copying machines. 3,975,096, Cl. 355-15.000.
Optigon Research & Development Corporation: *See—*
Lawson, John A., 3,975,090.
Orozco, Gilbert H.; and Logsdon, Donald N., to Man-Gill Chemical Company. Composition for and method for preparation of metal for subsequent cold working. 3,974,674, Cl. 72-42.000.
Ortho Diagnostics, Inc.: *See—*
Kraft, Patricia J.; Thomas, Marcia R.; and Kraft, Larry A., 3,975,156.
Orzel, Edward S., to Weatherhead Company, The. Blend back proportioning valve. 3,975,059, Cl. 303-6.00C.
Osaka Soda Co., Ltd.: *See—*
Suzui, Akio; Yoshimoto, Hiroshi; and Kuri, Takeshi. 3,975,349.
Osawa, Tagui: *See—*
Sameshima, Muneyasu; Osawa, Tagui; and Hirai, Utaka. 3,975,411.
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, to Celamerck GmbH & Co. KG. Agricultural plant protection compositions containing isomers of triforine method of use. 3,975,527, Cl. 424-250.000.
Othmer, Donald F. Pipe heating by AC in steel. 3,975,617, Cl. 219-300.000.
Otsuka Pharmaceutical Company Limited: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tanimura, Kaoru; and Tamada, Shigeharu. 3,975,391.
Ott, Peter Paul. Catapult device. 3,974,820, Cl. 124-20.00R.
Outboard Marine Corporation: *See—*
Hackbarth, Eugene R.; and Ward, Harry M., III. 3,975,122.
Outeki, Keiichi: *See—*
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato. 3,974,794.
Overhead Door Alert Company, Inc.: *See—*
Bowling, Roy E.; Buchtel, Arnold J.; and Keller, Dwight E., 3,975,723.
Owens-Illinois, Inc.: *See—*
Dietz, Earl D., 3,975,203.
Greenstein, Bernard, 3,975,201.
Salisbury, Charles W., 3,975,176.
Owens, Paul J.; and Maples, Ben, Jr. Arm restraining device. 3,975,015, Cl. 273-54.00B.
Oxy Metal Industries Corporation: *See—*
Kulick, Leonard; and Saad, Karim I., 3,975,214.
Ozutsumi, Minoru: *See—*
Ohnishi, Yoshitake; Ozutsumi, Minoru; Miyazawa, Yoshihide; and Gonda, Michihiro. 3,975,285.
P.C.S. Developments Limited: *See—*
Fox, John William, 3,975,258.
Pacault, Pierre Henri, to Fives-Cail Babcock Societe Anonyme. Hybrid cycle power plant with heat accumulator for storing heat exchange fluid transferring heat between cycles. 3,974,642, Cl. 60-39.18B.
Packbier, Mathijs W.; and Jonckers, Kees, to Stamicarbon B.V. Process and device for preparing prills. 3,975,472, Cl. 264-14.000.
Pagliari, Alberto: *See—*
Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto. 3,975,458.
Paige, Edward George Sydney, to British Secretary of State for Defence. Surface acoustic wave devices. 3,975,697, Cl. 333-30.00R.
Pako Corporation: *See—*
Getsch, Edward W., 3,974,626.
Palac, Kazimir; and Stachniak, Raymond M., to Zenith Radio Corporation. Method and apparatus for manufacturing a color cathode ray tube using interchangeable shadow masks. 3,975,198, Cl. 96-36.100.
Palmer, Billy W.; Bondurant, David L.; and Hagemeyer, Hugh J., Jr., to Eastman Kodak Company. Process for the preparation of polyhydric alcohols. 3,975,450, Cl. 260-635.00P.
Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla. 3,975,390.
Panigrahi, Godavarish, to Burroughs Corporation. Charge coupled device stack memory organization and refresh method. 3,975,717, Cl. 340-173.00R.
Panlaqui, Clayton: *See—*
Holt, Lloyd J.; and Panlaqui, Clayton. 3,974,990.
Paolini, Michael J.: *See—*
Kirk, Donald, Jr.; and Paolini, Michael J., 3,975,585.
Papai, Imre F. Fluid cylinder decelerating means. 3,974,910, Cl. 198-203.000.
Pape, Dieter: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim. 3,975,562.
Papelard, Michel Paul, to Viteci S.A. Electronic camera. 3,975,591, Cl. 178-7.200.
Parfimovich, Vasily Gavrilovich: *See—*
Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and Ruga, Viktor Astievich, administrator. 3,975,130.
Park, DeMoss. Rotary displacement coupling device. 3,974,900, Cl. 192-61.000.
Parks, Clarence E., to B. F. Goodrich Company, The. Expandable rigid vinyl chloride polymer compositions. 3,975,315, Cl. 260-2.50R.
Parma Industries, Inc.: *See—*
Shaltz, Gregory P.; and Armas, Joaquin P., 3,975,273.
Parrish, David Richard: *See—*
Hajos, Zoltan George; and Parrish, David Richard. 3,975,440.
Hajos, Zoltan George; and Parrish, David Richard. 3,975,442.
Parsons, Donald. Calf roping training aid. 3,974,799, Cl. 273-105.200.
Patent & Inventions Ltd.: *See—*
Nussbaumer, Thomas, 3,975,133.
Patik, Leonid Ozerovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich. 3,974,864.
Patil, Pandit G., to PPG Industries, Inc. Solar heat collector. 3,974,822, Cl. 126-271.000.
Patil, Pandit G., to PPG Industries, Inc. Solar collector having minimum edge heat loss. 3,974,823, Cl. 126-271.000.
Patterson, John W., to Syntex (U.S.A.) Inc. 20-Cyano-20,21-epoxy steroids. 3,975,378, Cl. 260-239.55D.
Patterson, Joseph H., to Fiber Industries, Inc. Process for preparing poly(tetramethylene terephthalate) yarn. 3,975,488, Cl. 264-210.00F.
Paulson, William T.; Davidson, David M., deceased (by Davidson, Clara A., executrix); Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., to Standard Register Company, The. Method for producing a business form article. 3,975,559, Cl. 427-146.000.
Pawloski, Chester E., to Dow Chemical Company, The. Certain 2-pyridyl-phosphonamidothioates and derivatives thereof. 3,975,393, Cl. 260-294.80K.
Payne, Robert William, to EMI Limited. Synthetic aperture radars including moving target indication. 3,975,734, Cl. 343-7.700.
Payne, Stephen C. Ultrasonic generator drive circuit. 3,975,650, Cl. 310-8.100.
PB Chemicals International Limited: *See—*
Crowe, Alan; and Fry, David Philip. 3,975,353.
Pearce, Larry N.; Lacy, C. Lyle; and Neumann, Arthur E., to Cotton Incorporated. Liquid atomizing method and apparatus. 3,974,964, Cl. 239-11.000.

Pearce, Peter J., to Synestructics, Inc. Minimum inventory maximum diversity building system. 3,974,600, Cl. 52-81.000.

Pearson, Michael John: *See—*
Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, 3,975,383.

Pease, William C., III: *See—*
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,974,763.

Peddinghaus, Rolf: *See—*
Stursberg, Bernd, 3,974,726.

Peddle, Charles I.: *See—*
Hepworth, Edward C.; Means, Rodney J.; and Peddle, Charles I., 3,975,712.

Pelham, Joseph E.; and La Haye, Frank W., to Thiokol Corporation. Rocket igniter. 3,974,772, Cl. 102-70.2QA.

Pelton, Edward L.; and Munk, Benedikt A., to United States of America, Air Force. Periodic antenna surface of tripole slot elements. 3,975,738, Cl. 343-872.000.

Pendleton, John F.: *See—*
Anderson, Roy S.; and Pendleton, John F., 3,975,332.

Peng, Stephen C.: *See—*
Labana, Santokh S.; and Peng, Stephen C., 3,975,456.

Penn Fishing Tackle Mfg. Co.: *See—*
Henze, Herbert O., 3,974,978.
Henze, Walter J.; and Thein, San, 3,974,589.

Penneck, Richard J.; and Wood, Alexander M., to Raychem Corporation. Heat-recoverable members. 3,975,039, Cl. 285-156.000.

Pennsylvania Wire Rope Corporation: *See—*
Kaufman, Alan D.; Reistad, Arne M., Jr.; and Wilke, David J., 3,974,712.

Pepperman, Armand B., Jr.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,975,560.

Perilstein, Warren L., to Ethyl Corporation. Hydraulic fluid compositions. 3,975,279, Cl. 252-78.500.

Peripheral Dynamics, Inc.: *See—*
Schisselbauer, John C.; Dobson, John J.; and Gerhart, James E., 3,975,010.

Perkin-Elmer Limited: *See—*
Taylor, Leonard Harold, 3,975,099.

Perrotti, Emilio: *See—*
Neri, Carlo; and Perrotti, Emilio, 3,975,430.

Perry, Philip G.: *See—*
Angelini, Dominic J.; and Perry, Philip G., 3,975,681.

Persson, Jan Edvard, to Atlas Copco Aktiebolag. Crawler vehicle. 3,974,891, Cl. 180-9.440.

Peter Lancier K.G. Maschinenbau-Hafenhuette: *See—*
Lancier, Peter, 3,974,856.

Petersen, Paul S., to MTS Systems Corporation. Sheet prefeeder forming an overhead stock loop to the input of an incremental feeder for a cupping press. 3,974,949, Cl. 226-42.000.

Peterson, Carl R., to Rapidex, Inc. Longwall canted drum mining machine. 3,975,056, Cl. 299-42.000.

Peterson, Dean M., to Honeywell Inc. Electrical connector. 3,975,077, Cl. 339-177.00R.

Peterson, Gerald H. Impact kinetic energy absorber. 3,975,006, Cl. 267-139.000.

Peterson, Harley G.; and Crough, Donald E., to Joy Manufacturing Company. Method for cleaning gas filter bags. 3,975,173, Cl. 55-96.000.

Petrovich, Vojislav. Froth flotation method for the recovery of minerals by means of ternary sulfonium nitrites and ternary stibine dinitrites. 3,975,265, Cl. 209-166.000.

Petterson, Carl, to Rema Electronic Ltd. Universally adjustable housing apparatus. 3,974,994, Cl. 248-23.000.

Peyton, John J.; and Wyman, James H., to Industrial Automation Corporation. Bottle handling apparatus. 3,975,260, Cl. 209-73.000.

Pfaff Industriemaschinen GmbH: *See—*
Groschopp, Hans, 3,974,627.

Phillips, K. G.; and Zarnecki, W. E., to Nalco Chemical Company. Linear dimethylamine-epichlorohydrin copolymer. 3,975,347, Cl. 260-29.2EP.

Phillips, Kenneth G.: *See—*
Tai, Wun Ten; and Phillips, Kenneth G., 3,975,305.

Phillips Petroleum Company: *See—*
Brown, Webster W., Jr., 3,975,164.
Cheng, Paul J., 3,975,504.
Hitzman, Donald O., 3,975,234.
Smith, Melvin E., 3,975,157.

Philp, James E.: *See—*
Brockett, Frank Howard, III; Philp, James E.; and Sullivan, Arthur Francis, 3,975,054.

Pick, George G., to Addressograph Multigraph Corporation. Font availability system for photocomposing machine. 3,975,745, Cl. 354-7.000.

Pickert, Hansjurgen; and Sesselmann, Dieter, to William Prym-Werke KG. Method and arrangement for sewing a slide fastener into a carrier material. 3,974,785, Cl. 112-113.000.

Pienaar, Jacobus Francois: *See—*
van Eeden, Stephanus Jacobus Daniel; and Pienaar, Jacobus Francois, 3,975,605.

Pierdet, Andre; and Coussediere, Daniel. Novel haptenes and antigens. 3,975,413, Cl. 260-397.100.

Pierrou, Rune Helmer, to Nitro-Nobel A.B. Liquid composition for the treatment of waste materials. 3,975,277, Cl. 252-2.000.

Pierson, Karl B., to Betts Machine Company. High volume fluid pressure relief valve. 3,974,850, Cl. 137-493.900.

Pierson, Marvin B.; and Flinchum, Charles, to Armco Steel Corporation. Method for preventing coating metal pickup on hot-dip coating line rolls. 3,975,556, Cl. 427-122.000.

Pignatti, Ugo; and Scacchetti, Giuliano. Attachment for sewing borders and collars on knitted garments. 3,974,788, Cl. 112-140.000.

Pike, John E.: *See—*
Lincoln, Frank H., Jr.; Pike, John E.; and Youngdale, Gilbert A., 3,975,404.

Pilatowicz, Edward J., to McCulloch Corporation. Method and apparatus for arresting movement of a chain saw cutter chain. 3,974,566, Cl. 30-382.000.

Pimentel, Daniel R., to Texas Instruments Incorporated. Valve. 3,974,844, Cl. 137-1.000.

Pitkethly, Robert Chalmers: *See—*
Crathorne, Elizabeth Anne; Howell, Ian Valentine; and Pitkethly, Robert Chalmers, 3,975,299.

Pitney-Bowes, Inc.: *See—*
Deisting, Horst, 3,975,013.
Luperti, Harry E.; Irvine, Robert; and Hordeski, Edward R., 3,974,749.
Montillier, Jean-Pierre, 3,975,196.

Pitts, Charles Cee, to Pitts, Hazel Y. Device to stabilize a dump body vehicle on laterally angulated terrain by movement of the contents during the elevation thereof. 3,975,052, Cl. 298-1.00B.

Pitts, Hazel Y.: *See—*
Pitts, Charles Cee, 3,975,052.

Pivot Punch Corporation: *See—*
Herlan, Alton G., 3,974,728.

Placek, Eugene W., to International Magna Corporation. Space heater. 3,975,140, Cl. 431-329.000.

Placontrol Inc.: *See—*
Chodorow, Ingran S., 3,974,842.

Plass, Reinhold: *See—*
Himmele, Walter; Hofmann, Ernst; Hoffmann, Herwig; and Plass, Reinhold, 3,975,400.

Plastofilm Industries, Inc.: *See—*
Shadle, Jesse L., 3,974,724.

Platt Saco Lowell Corporation: *See—*
Clevenger, Earl C., 3,974,633.
McCall, William S.; and Pray, Lester W., 3,974,634.

Plotnick, Richard J.: *See—*
Martz, Lyle F.; and Plotnick, Richard J., 3,974,644.

Pohl, Robert; and Nelson, Bascom. Mono-coque building structure and methods. 3,974,602, Cl. 52-93.000.

Polaroid Corporation: *See—*
Borror, Alan L.; and Greenwald, Richard B., 3,975,423.
Johnson, Bruce K.; and Whiteside, George D., 3,975,744.

Polysius AG: *See—*
Vering, Antonius; and Loffler, Bernhard, 3,975,147.

Pommerening, Uwe A., to Stromberg-Carlson Corporation. Trunk consultation arrangement. 3,975,596, Cl. 179-18.0BC.

Ponder & Best, Inc.: *See—*
Betensky, Ellis I., 3,975,089.

Porret, Daniel: *See—*
Habermeier, Juergen; and Porret, Daniel, 3,975,397.

Porter, Samuel, Jr.: *See—*
Chang, Wen-Hsuan; and Porter, Samuel, Jr., 3,975,457.

Postolaty, Vitaly Mikhailovich: *See—*
Boshnyaga, Valery Anatolievich; Kalinin, Lev Pavlovich; and Postolaty, Vitaly Mikhailovich, 3,975,673.

Poulain, Claude, to Ato Chimie. Process for preparing N-alkyl-lactams. 3,975,377, Cl. 260-239.30R.

Pout, Christopher Ronald: *See—*
Eyles, Martin Keith; and Pout, Christopher Ronald, 3,975,303.

Powe, Carl M.: *See—*
Claunch, Robert W.; Deane, Thomas N.; Rogan, Patrick D. M.; Powe, Carl M.; and Werner, Mark, 3,974,528.

Power, George Edward, to Formica Corporation. Thin, tough, stable, mar-resistant laminate. 3,975,572, Cl. 428-452.000.

Powlesland Engineering Limited: *See—*
Powlesland, John W., deceased; Kidd, James Kenneth, executor; and Powlesland, Isabella, executrix, 3,974,754.

Powlesland, Isabella, executrix: *See—*
Powlesland, John W., deceased; Kidd, James Kenneth, executor; and Powlesland, Isabella, executrix, 3,974,754.

Powlesland, John W., deceased; by Kidd, James Kenneth, executor; and by Powlesland, Isabella, executrix, to Powlesland Engineering Limited. Controlled fluid flow systems. 3,974,754, Cl. 98-33.00A.

Poy, Guy, to Rhone-Poulenc S.A. Process for the preparation of polyvinyl chloride foams. 3,975,361, Cl. 260-46.50R.

PPG Industries, Inc.: *See—*
Bosso, Joseph F.; and Wismer, Marco, 3,975,346.
Chang, Wen-Hsuan; and Porter, Samuel, Jr., 3,975,457.
Cross, Christopher G.; Kirk, Charles E.; and Molnar, James R., 3,974,914.
Marchetti, Joseph R.; and Jerabek, Robert D., 3,975,250.
Patil, Pandit G., 3,974,822.
Patil, Pandit G., 3,974,823.

Pray, Lester W.: *See—*
McCall, William S.; and Pray, Lester W., 3,974,634.

Price, Richard M.: *See—*
Dominick, George G.; Erickson, Kenneth H.; and Price, Richard M., 3,974,961.

Price, William R.: *See—*
Conner, Charles C.; and Price, William R., 3,974,893.
Princeton Polymer Laboratories, Incorporated: *See—*
Hudgin, Donald Edward; and Blair, Edgar Allan, 3,975,350.
Pringle, William L., to United States Steel Corporation. Brake actuator assembly. 3,974,897, Cl. 188-196.00A.
Pritchard, John A.: *See—*
Mitchell, Terence G.; and Pritchard, John A., 3,974,838.
Produits Chimiques Pechiney-Saint Gobain: *See—*
LePage, Madeleine, 3,975,293.
Professional Amateur Industries, Inc.: *See—*
Galich, Thomas Patrick, 3,975,017.
Progressive Swing Method, Inc.: *See—*
Stephan, Lawrence J., 3,975,024.
Puddington, Ira Edwin: *See—*
Farnand, Joseph Redmond; and Puddington, Ira Edwin, 3,975,194.
Puletti, Paul P.: *See—*
Georgoudis, Paul C.; Schoenberg, Jules E.; Ray-Chaudhuri, Dilip K.; and Puletti, Paul P., 3,975,323.
Pupich, John J.: *See—*
Chow, Sen-Te; and Pupich, John J., 3,975,586.
Qonaar Corporation: *See—*
Dominick, George G.; Erickson, Kenneth H.; and Price, Richard M., 3,974,961.
Quaker City Gear Works, Inc.: *See—*
Sulzer, Harry E., 3,974,962.
Quinn, David A., to Supreme Equipment & Systems Corporation. File cabinet construction. 3,975,071, Cl. 312-323.000.
Quinn, Robert Michael; Schuele, William John; and Unis, Richard Alan, to International Business Machines Corporation. Diffusion control for controlling parasitic capacitor effects in single FET structure arrays. 3,975,220, Cl. 148-187.000.
Quinn, William T., III. Holding frame for facial identification system. 3,974,576, Cl. 35-28.000.
R.K.S.: *See—*
Martin, Jacques Lucien Joseph, 3,975,067.
Rabi, Rafat T.: *See—*
Smyk, Rostyslaw R.; and Rabi, Rafat T., 3,975,314.
Rach, David T., to J. I. Case Company. Fail-safe brake for a vehicle. 3,974,896, Cl. 188-170.000.
Rachor, Lothar: *See—*
Hrovat, Milan; and Rachor, Lothar, 3,975,471
Racunas, Bernard J.; and Kastelic, Raymond, to Aluminum Company of America. Ring furnace. 3,975,149, Cl. 432-209.000.
Radd, Frederick J.; Wolfe, Louis H.; and Oertle, Donald H., to Continental Oil Company. Process change sensor. 3,975,253, Cl. 204-195.00R.
Raganato, Carlo: *See—*
Gabellieri, Rodolfo; and Raganato, Carlo, 3,975,163.
Rail, Helmut: *See—*
Kerzman, Jack A.; and Rail, Helmut, 3,974,775.
Ramacciotti, Aldo; Repetto, Eugenio; and Sommovigo, Paolo, to Centro Sperimentale Metallurgico S.p.A. Compound meltable electrode for manufacturing metal articles by remelting under electroslag. 3,975,577, Cl. 13-18.000.
Ramirez, Ernest R., to Swift & Company. Purification of industrial waste waters by flotation. 3,975,269, Cl. 210-44.000.
Ranck, Ralph Oliver, to Du Pont de Nemours, E. I., and Company. Polyester film coated with an inorganic coating and with a vinylidene chloride copolymer containing a linear polyester resin. 3,975,573, Cl. 428-480.000.
Rank Xerox Ltd.: *See—*
Takeuchi, Osamu, 3,974,944.
Ranke, Gerhard, to Linde Aktiengesellschaft. Recovery of gaseous components from scrubbing liquid. 3,975,172, Cl. 55-40.000.
Rapidex, Inc.: *See—*
Peterson, Carl R., 3,975,056.
Rasmussen, Robert F.: *See—*
Wahlstedt, Robert L.; Rasmussen, Robert F.; and Johnson, Lee W., 3,974,902.
Ratti, Giulio: *See—*
Chain, Ernst Boris; Buck, Kenneth William; Darbyshire, Joan Elizabeth; Banks, Geoffrey Talbot; Himmelweit, Fred; and Ratti, Giulio, 3,975,520.
Rattmann, Rudolf: *See—*
Soldner, Richard; and Rattmann, Rudolf, 3,974,682.
Rauffer, Walter: *See—*
Hofmann, Wilfried; Dietrich, Karl-Heinz; Rauffer, Walter; Schuhmeir, Eugen; and Kohler, Reinhard, 3,975,749.
Ray-Chaudhuri, Dilip K.: *See—*
Georgoudis, Paul C.; Schoenberg, Jules E.; Ray-Chaudhuri, Dilip K.; and Puletti, Paul P., 3,975,323.
Ray, Otis Eugene. Chum dispensing attachment for fishing rigs. 3,974,591, Cl. 43-43.140.
Raybeth Tool & Die Co., Inc.: *See—*
Lossini, Elio, 3,974,545.
Raychem Corporation: *See—*
Penneck, Richard J.; and Wood, Alexander M., 3,975,039.
Raymond Engineering Inc.: *See—*
Stone, Robert L., 3,974,982.
Raymond Lee Organization, Inc., The: *See—*
Glenn, John P., 3,975,036.
Morar, Michael A., 3,975,645.
Raytheon Company: *See—*
Hapgood, William H., 3,975,137.
Richards, Gerald P., 3,975,732.
RCA Corporation: *See—*
Lachocki, Eugene, 3,975,672.
Ladany, Ivan; Limm, Albert Chang; and O'Brien, James Thomas, 3,975,555.
Mueller, Charles William; and Douglas, Edward Curtis, 3,974,560.
Redding, Robert J., to Skinner Precision Industries, Inc. Pneumatic and hydraulic control valves. 3,975,666, Cl. 317-151.000.
Reddy, K. Narasimha: *See—*
Henderson, Robert M.; Zechlin, Richard; and Reddy, K. Narasimha, 3,974,816.
Redford, David A., to Texaco Exploration Canada Ltd. Sand control method employing low temperature oxidation. 3,974,877, Cl. 166-276.000.
Redman, Charles M., to United States of America, Army. Fiber acoustic waveguide and system. 3,975,698, Cl. 333-30.00R.
Reed, Terry J.: *See—*
Smith, Jack R.; and Reed, Terry J., 3,974,643.
Reedy, James D.: *See—*
Yang, Kang; and Reedy, James D., 3,975,230.
Reel Precision Maufacturing Corporation: *See—*
Wahlstedt, Robert L.; Rasmussen, Robert F.; and Johnson, Lee W., 3,974,902.
Reflexite Corporation: *See—*
Rowland, William P., 3,975,083.
Reggia, Frank: *See—*
Joncs, Howard S., Jr.; and Reggia, Frank, 3,975,737.
Regie Nationale des Usines Renault: *See—*
Castellani, Claude; and Roger, Yves, 3,974,677.
Giordano, Jean Louis; and Guettier, Michel, 3,975,062.
Rehor, Jan: *See—*
Zdarsky, Josef; Rehor, Jan; and Bretschneider, Rudolf, 3,975,204.
Reicheneder, Franz; Kropp, Rudolf; Amann, August; Giertz, Hubert; and Schuster, Joerg, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Sympathicomimetic remedy inducing vasopresaor effects after oral and parenteral administration. 3,975,526, Cl. 424-250.000.
Reichert, Hartmut: *See—*
Trischler, Gunther; and Reichert, Hartmut, 3,975,743.
Reichert, Kurt: *See—*
Baer, Hans; and Reichert, Kurt, 3,974,551.
Reid, James Paul, Jr.: *See—*
Yelton, Emerson McBrayer; and Reid, James Paul, Jr., 3,974,534.
Reiger, Arthur C., Jr.; and Finegold, Hyman B., to Globe Tool and Engineering Company, The. Turret for workpiece and method. 3,974,553, Cl. 29-38.00C.
Reijnierse, Pieter: *See—*
Beun, Matthijs; and Reijnierse, Pieter, 3,975,709.
Reilly, Richard S.: *See—*
Markowski, Stanley J.; and Reilly, Richard S., 3,974,646.
Reinehr, Ulrich; Nogaj, Alfred; and Schmidt, Wolfhard, to Bayer Aktiengesellschaft. Process for the production of acrylic fibers processible into yarns with improved textile properties and low boiling-induced shrinkage values. 3,975,337, Cl. 526-341.000.
Reinhall, Rolf Bertil. Grinding discs for defibering fibrous material. 3,974,971, Cl. 241-261.300.
Reinhardt, Robert M.: *See—*
Kullman, Russell M. H.; and Reinhardt, Robert M., 3,975,370.
Reinshagen, H. Alan; and Edelman, Leonard E., to Westinghouse Electric Corporation. Rapid drying epoxy resin ester. 3,975,322, Cl. 260-18.0EP.
Reis, August: *See—*
Eibl, Volker; and Reis, August, 3,975,246.
Reisman, Arnold: *See—*
Hochberg, Frederick; and Reisman, Arnold, 3,974,769.
Reistad, Arne M., Jr.: *See—*
Kaufman, Alan D.; Reistad, Arne M., Jr.; and Wilke, David J., 3,974,712.
Rejzner, Jacques Serge: *See—*
Camboulives, Andre Alphonse Mederic Leon; le Maout, Theophile Francois; Rejzner, Jacques Serge; and Vandenbroucke, Roger Alfred Jules, 3,974,649.
Rekesius, John F., to Alco Foodservice Equipment Company. Apparatus for toasting bread-like articles. 3,974,759, Cl. 99-386.000.
Reliable Electric Company: *See—*
Baumbach, Bertram W., 3,975,664.
Rema Electronic Ltd.: *See—*
Petterson, Carl, 3,974,994.
Rencin, Miloslav; Rod, Josef; and Seidl, Pavel, to Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi. Yarn breakage detection circuitry for knitting machines. 3,974,665, Cl. 66-163.000.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 3,974,921.
Renn, Donald W., to Marine Colloids, Inc. Applying reagent to medium and device therefor. 3,975,162, Cl. 23-253.0TP.
Renth, Ernst-Otto: *See—*
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; and Danneberg, Peter, 3,975,525.
Repenning, William, to Natico, Inc. Apparatus for lining drums with plastic material. 3,975,134, Cl. 425-504.000.
Repetto, Eugenio, to Centro Sperimentale Metallurgico S.p.A. Apparatus for monitoring steelmaking. 3,974,691, Cl. 73-190.00R.
Repetto, Eugenio: *See—*
Ramacciotti, Aldo; Repetto, Eugenio; and Sommovigo, Paolo, 3,975,577.
Resinoid Engineering Corporation: *See—*
Herbst, Clarence A., Sr., 3,974,969.

Ressorts du Nord S.A.: *See—*
Duchemin, Michel Leon, 3,975,005.
Reymond, Jean Claude: *See—*
Merenda, Pierre; and Reymond, Jean Claude, 3,975,659.
Reynolds Metals Company: *See—*
Gates, Edward Jack, 3,975,144.
Kibby, Robert M., 3,975,187.
Rhodes, Keith H., to J. I. Case Company. Grass catcher assembly. 3,974,631, Cl. 56-202.000.
Rhone-Poulenc S.A.: *See—*
Balme, Maurice, 3,975,401.
Bouchaudon, Jean; Le Roy, Pierre; and Messer, Mayer Naoum, 3,975,385.
Brunet, Jean-Paul; and Cometti, Andre, 3,975,437.
Dumoulin, Jean, 3,975,294.
Poy, Guy, 3,975,361.
Rice, Hal H.: *See—*
Mitchell, Harry R.; Rice, Hal H.; and Abel, James R., 3,974,650.
Richards, Gerald P., to Raytheon Company. Second difference function generator. 3,975,732, Cl. 343-16.00R.
Richardson, Frank Peter; and Young, David Anthony, to J. F. Pritchard and Company. Method of prevention and removal of sulfur deposits from H_2S absorption equipment. 3,975,508, Cl. 423-571.000.
Richert, Karl Hartwig: *See—*
Blahak, Johannes; Muller, Erwin; and Richert, Karl Hartwig, 3,975,428.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,975,390.
Ricoh Co., Ltd.: *See—*
Nishikawa, Tatsuo, 3,974,974.
Ridgeway, William V. Temporary dental crown protector. 3,974,567, Cl. 32-1.000.
Rieger, Werner. Series of matched sets of compatible chain-system parts. 3,974,641, Cl. 59-93.000.
Riley, Michael O.: *See—*
Kim, Yung K.; and Riley, Michael O., 3,975,362.
Ringer, Hayden N., to Aeronutronic Ford Corporation. Target detecting system. 3,975,729, Cl. 343-5.0PD.
Rivero, Victor. Signal generating device actuated by a non-reusable two channel coded magnetic recording medium. 3,975,713, Cl. 340-149.00R.
Robert Bosch G.m.b.H.: *See—*
Dworak, Wilhelm; and Muller, Karl-Heinz, 3,975,124.
Eheim, Franz, 3,974,814.
Knapp, Heinrich; Brettschneider, Johannes; and Bundesen, Lorenz, 3,974,813.
Konrath, Karl, 3,974,812.
Stumpp, Gerhard; Jaggle, Gunther; Krauss, Rudolf; and Scharl, Herbert, 3,974,809.
Stumpp, Gerhard; Michel, Friedbert; and Steiner, Josef, 3,974,811.
Zorn, Karl-Ludwig, 3,975,630.
Roberts, Alfred M., to Campbell Chain Company. Load binder security system. 3,974,544, Cl. 24-68.0CT.
Robertshaw Controls Company: *See—*
Tyler, Hugh Jean, 3,975,669.
Roch, Josef: *See—*
Narr, Berthold; Roch, Josef; Muller, Erich; and Haarmann, Walter, 3,975,384.
Nickl, Josef; Muller, Erich; Schroter, Wolfgang; Haarmann, Walter; and Roch, Josef, 3,975,524.
Rockwell International Corporation: *See—*
Fosness, John P.; and Odor, Louis, 3,974,673.
Molina, Orlando G., 3,975,634.
Rod, Josef: *See—*
Rencin, Miloslav; Rod, Josef; and Seidl, Pavel, 3,974,665.
Rodgers, Thurman J., to American Micro-Systems, Inc. Low capacitance V groove MOS NOR gate and method of manufacture. 3,975,221, Cl. 148-191.000.
Rodzewich, Edward A., to Amchem Products, Inc. Cleaner for tin plated ferrous metal surfaces. 3,975,215, Cl. 148-6.170.
Roeder, George K.; and Hardy, Raymond. Method and apparatus for artificial lift from multiple production zones. 3,974,878, Cl. 166-314.000.
Rogan, Patrick D. M.: *See—*
Claunch, Robert W.; Deane, Thomas N.; Rogan, Patrick D. M.; Powe, Carl M.; and Werner, Mark, 3,974,528.
Roger, Yves: *See—*
Castellani, Claude; and Roger, Yves, 3,974,677.
Rogers, Robert M.: *See—*
Allen, Kenneth C.; and Rogers, Robert M., 3,974,887.
Rohm and Haas Company: *See—*
Geyer, Wolfgang G., 3,975,155.
Hurt, William S., 3,975,420.
Rohner, Benedikt, to Spichtig AG Kunststoffwerk Steinen. Rigid container enclosed on five sides. 3,974,934, Cl. 220-4.00F.
Roland, Raymond: *See—*
Coquery, Jean-Paul; Labedan, Pierre; and Roland, Raymond, 3,974,666.
Rongus, Leo P., to United States of America, Army. Energy base for safety and arming device. 3,974,773, Cl. 102-81.000.
Rood, William H.: *See—*
Lusk, Joe F.; and Rood, William H., 3,975,708.
Rooney, Robert L.; and Sautter, James W., to Conchemco, Incorporated. Automatic paint cure tester. 3,974,678, Cl. 73-7.000.
Rose, Peter: *See—*
Goos, Heinz; and Rose, Peter, 3,975,618.
Rosemount Inc.: *See—*
Frick, Roger L., 3,975,719.
Rosenfeld, Alvin H.; and Zanoni, Carl A., to Zygo Corporation. Scanning photoelectric autocollimator. 3,975,102, Cl. 356-167.000.
Rossetti, Charles. Cylinder locks. 3,974,671, Cl. 70-375.000.
Rossler, Ernst: *See—*
Lill, Viktor; Rossler, Ernst; Svoboda, Josef; and Weigl, Erwin, 3,975,033.
Weigl, Erwin; Rossler, Ernst; and Svoboda, Josef, 3,975,034.
Rote, Franklin B. Method of producing cast iron. 3,975,191, Cl. 75-130.00R.
Rothwell, Eric: *See—*
Smalley, Graham; and Rothwell, Eric, 3,975,496.
Rottmayer, Robert: *See—*
Spash, John L.; and Rottmayer, Robert, 3,975,770.
Roule, Maurice; and Saglio, Robert, to Commissariat a l'Energie Atomique. Ultrasonic system for focusing at an oblique angle of incidence. 3,974,684, Cl. 73-71.5US.
Roussel-UCLAF: *See—*
Derible, Pierre Henri; Torelli, Vesperto; and Dumont, Claude, 3,975,529.
Row, Grant David: *See—*
Gray, Peter Harrison; Row, Grant David; and Stinson, John David, 3,974,942.
Rowe, Norman L.: *See—*
Green, Dale; Erway, Duane; Condon, Robert; Schoonover, William C.; and Rowe, Norman L., 3,975,748.
Rowland, Bobby A.: *See—*
Tate, Stanley L.; Rowland, Bobby A.; and Blackstone, Michael M., 3,975,208.
Rowland, William P., to Reflexite Corporation. Wide angle retroreflector assembly and method of making same. 3,975,083, Cl. 350-103.000.
Royer, Dennis Jack; and Hritz, George G., to Continental Oil Company. Process for producing alpha alumina monohydrate. 3,975,509, Cl. 423-626.000.
Royer, Dennis Jack: *See—*
Leach, Bruce E.; Hritz, George G.; and Royer, Dennis Jack, 3,975,510.
RPR, Inc.: *See—*
Davis, Frederick, 3,975,288.
Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Compounds for enzyme amplification assay - - ecgonine analogs. 3,975,237, Cl. 195-63.000.
Ruble, Herschel C.: *See—*
Bohl, Thomas L.; Goodnight, Lyman E., Jr.; Ruble, Herschel C.; and Wells, John H., 3,975,160.
Rucker, Howard Lewis: *See—*
Boyle, Robert John; Rucker, Howard Lewis; Mastro, Alex Anthony; and Jackson, Thomas Peter, 3,975,026.
Ruckriegel, Alfred E., to Winzeler Stamping Co. Slide assembly for extendable table. 3,974,782, Cl. 108-83.000.
Ruda, Raymond J., to Bagcraft Corporation of America. Header bag. 3,974,958, Cl. 229-55.000.
Ruda, Raymond J., to Bagcraft Corporation of America. Bag having modified closure flaps. 3,974,959, Cl. 229-62.000.
Rudloff, Bernard. Process for manufacturing stratified materials. 3,975,483, Cl. 264-137.000.
Rudness, Robert G., to Union Carbide Corporation. Low-friction, wear-resistant material and process for making the same. 3,975,568, Cl. 428-329.000.
Ruehrwein, Robert A., to Semimetals, Inc. Process for production of III-V compound epitaxial crystals. 3,975,218, Cl. 148-175.000.
Ruga, Asty Sevastyanovich, deceased: *See—*
Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and Ruga, Viktor Astievich, administrator, 3,975,130.
Ruga, Viktor Astievich, administrator: *See—*
Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and Ruga, Viktor Astievich, administrator, 3,975,130.
Ruhrchemi Aktiengesellschaft: *See—*
Speth, Sebastian, 3,974,697.
Rulison, Richard N., to Celanese Corporation. Process for drawing acrylic fibrous materials to form a product which particularly is suited for thermal stabilization and carbonization. 3,975,482, Cl. 264-131.000.
Russell, Lionel E.; and McNabb, David Franklin. Lawn mower with improved mulching attachment. 3,974,629, Cl. 56-13.700.
Russo, Anthony: *See—*
Bent, John H.; and Russo, Anthony, 3,975,032.
Russo, Anthony Joseph: *See—*
Dunn, James Grant; Cowan, John Richard; and Russo, Anthony Joseph, 3,975,587.
Russo, Robert V., to M & T Chemicals Inc. Method of preparing nonfriable rigid polyurethane foam. 3,975,317, Cl. 260-2.5AC.
Ruzek, Ivo; Worf, Guenther; Hartmann, Ludwig; Maahs, Paul; and Gerking, Lueder, to Lutravil Spinnvlies GmbH & Co. Dimensionally stable, high-tenacity non-woven webs and process. 3,975,224, Cl. 156-167.000.

Ryan, Douglas G.: *See—*
Bushnell, James D.; and Ryan, Douglas G., 3,975,396.
Ryan, John W.; and Moore, James D. Lawn bowling apparatus. 3,975,014, Cl. 273-45.000.
S.A.E.S. Getters S.p.A.: *See—*
della Porta, Paolo; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 3,975,304.
S.T.X., Groupement d'Interet Economique: *See—*
Coquery, Jean-Paul; Labedan, Pierre; and Roland, Raymond, 3,974,666.
S & W Ammunition Company: *See—*
Clark, Homer E., Jr., 3,974,770.
Saad, Karim I.: *See—*
Kulick, Leonard; and Saad, Karim I., 3,975,214.
Saarenketo, Tapio Heikki. Tree harvesting method and device. 3,974,866, Cl. 144-3.00D.
Sachs-Systemtechnik GmbH: *See—*
Eibl, Volker; and Reis, August, 3,975,246.
Sacks, William: *See—*
Bollen, Phillip Stuart; Amin, Surendra A.; and Sacks, William, 3,975,485.
Sado, Yukio, to Yoshida Kogyo Kabushiki Kaisha. Prefabricated balustrade with means for connection of balusters to a rail. 3,975,000, Cl. 256-59.000.
Saenz, August M.: *See—*
Barteau, John F.; King, George J.; and Saenz, August M., 3,975,070.
Sagami Chemical Research Center: *See—*
Ichikawa, Masaru; Tanaka, Eiji; and Tamaru, Kenzi, 3,975,454.
Kondo, Kiyosi; and Mori, Fumio, 3,975,381.
Sagane, Masahiko, to Kansai Paint Company, Ltd. Liquid crystal composition for electric field indication. 3,975,287, Cl. 252-299.000.
Sagawa, Seiji; Kimura, Osamu; Sekimori, Kenji; and Ito, Fumiyuki, to Sumitomo Chemical Company; and Kyodo Chemical Company, Ltd. Process for producing halogenated organotin compounds. 3,975,417, Cl. 260-429.700.
Saglio, Robert: *See—*
Roule, Maurice; and Saglio, Robert, 3,974,684.
Saint-Gobain Industries: *See—*
Camerlinck, Pierre, 3,975,174.
Saito, Kazuo, deceased: *See—*
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.
Saito, Nobuko, heir: *See—*
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.
Sakasai, Yutaka: *See—*
Yamashita, Hiroshi; and Sakasai, Yutaka, 3,975,199.
Sakusabe, Koji: *See—*
Yasunaga, Yoshikazu; Hokao, Zenjiro; Sakusabe, Koji; and Tago, Yoshimitsu, 3,975,228.
Salisbury, Charles W., to Owens-Illinois, Inc. Method of sealing tubulation with preformed solder glass. 3,975,176, Cl. 65-38.000.
Saluke, William M., to NCR Corporation. Magnetic coatings for credit cards. 3,975,574, Cl. 428-483.000.
Sameshima, Muneyasu; Osawa, Tagui; and Hirai, Utaka, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing 1-aminoanthraquinone. 3,975,411, Cl. 260-378.000.
Sanchez, Lois Loreen: *See—*
Blomgren, David Carl; and Sanchez, Robert D., 3,974,753.
Sanchez, Robert D.: *See—*
Blomgren, David Carl; and Sanchez, Robert D., 3,974,753.
Sanchez, Robert Daniel: *See—*
Blomgren, David Carl; and Sanchez, Robert D., 3,974,753.
Sanders Associates, Inc.: *See—*
Janosky, Milton J., 3,975,662.
Sandler, Joseph J.: *See—*
Wallick, Seymour Dudley; Sandler, Joseph J.; Sandler, Marc L.; and Zabroski, Frank, 3,974,967.
Sandler, Marc L.: *See—*
Wallick, Seymour Dudley; Sandler, Joseph J.; Sandler, Marc L.; and Zabroski, Frank, 3,974,967.
Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 3,975,386.
Sandoz Ltd.: *See—*
Avar, Lajos; and Hofer, Kurt, 3,975,382.
Wicki, Heinz, 3,975,369.
Sandstrom, Paul H.: *See—*
Lal, Joginder; and Sandstrom, Paul H., 3,975,336.
Sankyo Company Limited: *See—*
Murayama, Keisuke; Morimura, Syoji; and Yoshioka, Takao, 3,975,357.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.
Sano, Shunichi; and Kasahara, Kohichi, to Tokyo Shibaura Electric Co., Ltd. Color television receiver. 3,975,766, Cl. 358-65.000.
Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Sugimatsu, Akihito; Yorozu, Makoto; Nomura, Tadayoshi; Yoshino, Isamu; and Yoshikawa, Hachiro, 3,975,569.
Sarasota Instruments Inc.: *See—*
Minto, Wallace Louis, 3,975,097.
Sarre, Olga: *See—*
Ganguly, Ashit K.; and Sarre, Olga, 3,975,372.
Sasano, Mitsuharu, to Toyo Musen Co. Ltd. Tuner mechanism. 3,974,704, Cl. 74-10.330.
Sato, Kazuhiro; Ishibashi, Shizuka; and Eto, Yoshizumi, to Hitachi, Ltd.; and Hitachi Electronics Co., Ltd. Method of and apparatus for controlling amount of electron beam in image pickup tube. 3,975,657, Cl. 315-10.000.
Sato, Mitsunori: *See—*
Sekiguchi, Hideto; Sone, Masao; and Sato, Mitsunori, 3,975,486.
Sato, Teizo: *See—*
Sugahara, Mitsuaki; Sato, Teizo; Kobayashi, Sakae; and Kanekawa, Akira, 3,975,207.
Sato, Yasuo: *See—*
Kamikado, Toshiya; Kuragano, Takashi; Konishi, Kazuo; Sato, Yasuo; and Nagano, Masayoshi, 3,975,538.
Satsumabayashi, Kazuyoshi; and Kato, Takeshi, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for sealing a track shoe. 3,975,028, Cl. 277-94.000.
Satterthwaite, Edward W. Modular architectural educational toy and playground erector-set and building system. 3,974,611, Cl. 52-309.000.
Satterwhite, Charles R., to Unit Rig & Equipment Co. All electric excavating and loading system. 3,974,580, Cl. 37-189.000.
Saunders, Michael A.: *See—*
Brown, Louis R.; and Saunders, Michael A., 3,974,983.
Saunders Transport Limited: *See—*
May, Frank Herbert; and Marshall, William Wilfred, 3,974,889.
Saunier, Bernard; and Derreumaux, Antoine. Process for sterilizing water by the combination of chlorine and another halogen. 3,975,271, Cl. 210-62.000.
Saupe, Wolfram, to Hoechst Aktiengesellschaft. Fixing thermoplastic material on a carrier. 3,975,146, Cl. 432-59.000.
Sautter, James W.: *See—*
Rooney, Robert L.; and Sautter, James W., 3,974,678.
Saxholm, Rolf. Arrangement in connection with a printer with keyboard for printing data in plain language and simultaneously recording corresponding coded data. 3,975,716, Cl. 340-172.500.
Scacchetti, Giuliano: *See—*
Pignatti, Ugo; and Scacchetti, Giuliano, 3,974,788.
Scarponi, Ugo: *See—*
Arcari, Giuliana; De Micheli, Pietro; Luini, Fulvio; and Scarponi, Ugo, 3,975,389.
Schaffner, Joseph G.; Werner, Joseph A.; and Klein, Jacob, to United States of America, Army. Projectile for a weapon system. 3,974,774, Cl. 102-90.000.
Schaller, Kurt: *See—*
Gilomen, Beat; and Schaller, Kurt, 3,974,639.
Schalles, Erhard; Latten, Werner; and Stender, Reinhard, to Gildemeister Aktiengesellschaft. Multiple-spindle machine tool. 3,974,721, Cl. 82-3.000.
Schaper, Barbara J.: *See—*
Mazdiyasni, Khodabakhsh S.; and Schaper, Barbara J., 3,975,416.
Scharf, Erich. Flaw detecting method and apparatus. 3,975,644, Cl. 250-563.000.
Scharl, Herbert: *See—*
Stumpp, Gerhard; Jaggle, Gunther; Krauss, Rudolf; and Scharl, Herbert, 3,974,809.
Scheibelhoffer, Anthony S.: *See—*
Barnewall, James M.; and Scheibelhoffer, Anthony S., 3,975,329.
Schenk, Wolfgang: *See—*
Schmidt, Franz; Fahrbach, Gerhard; Schenk, Wolfgang; and Seiler, Erhard, 3,975,459.
Schering Corporation: *See—*
Ganguly, Ashit K.; and Sarre, Olga, 3,975,372.
Schibbye, Lauritz Benedictus, to Svenska Rotor Maskiner Aktiebolag. Shaft seals for a screw compressor. 3,975,123, Cl. 418-97.000.
Schick Incorporated: *See—*
Doyle, Edward J.; and Bartram, Nial C., 3,974,840.
Schick, Rupert: *See—*
Nintz, Eckhard; Schick, Rupert; Horacek, Heinrich; and Stahnecker, Erhard, 3,975,327.
Schiedermayer, Marvin Lee: *See—*
Siktberg, Richard Philip; and Schiedermayer, Marvin Lee, 3,975,616.
Schisselbauer, John C.; Dobson, John J.; and Gerhart, James E., to Peripheral Dynamics, Inc. Card reader with improved picking and transport arrangement. 3,975,010, Cl. 271-4.000.
Schiweck, Hubert: *See—*
Munir, Mohammad; Schiweck, Hubert; Weinz, Hans-Werner; and Wurm, Fritz, 3,975,205.
Schlegel, Earl S., to Westinghouse Electric Corporation. Gate assist turn-off, amplifying gate thyristor and a package assembly therefor. 3,975,758, Cl. 357-74.000.
Schlicht, Raymond C.; and McCoy, Frederic C., to Texaco Inc. Removal of unconsumed reactants and polar by-products from reaction product mixtures through adsorption on polyurethane foam. 3,975,387, Cl. 260-247.50R.
Schluter, Klaus, to Krauss-Maffei Aktiengesellschaft. System for filling a mold with reactive synthetic-resin components. 3,975,128, Cl. 425-207.000.
Schmid, Ingobert: *See—*
Hontschik, Heinrich; Schmid, Ingobert; and Greiner, Peter, 3,975,037.
Schmid, Lawrence A. Modular aerator and separator assembly for sewage treatment facility. 3,975,276, Cl. 210-207.000.

Schmidt, Franz; Fahrbach, Gerhard; Schenk, Wolfgang; and Seiler, Erhard, to BASF Aktiengesellschaft. Thermoplastic molding compositions of high impact resistance. 3,975,459, Cl. 260-876.00B.

Schmidt, Kurt H., to Johann A. Wulfing Fabrik Pharmazeutischer Praparate. Cardioglycoside derivatives of the strophanthidin type, a process for their manufacture and medicinal preparations containing these compounds. 3,975,373, Cl. 536-7.000.

Schmidt, Oskar: *See—*
Distler, Walter; Kraus, Helmut; Schwarz, Christian; and Schmidt, Oskar, 3,975,740.

Schmidt, Wolfhard: *See—*
Reinehr, Ulrich; Nogaj, Alfred; and Schmidt, Wolfhard, 3,975,337.

Schmitt, Ernst, to Bayer Aktiengesellschaft. Dihydroindoles and indolenine dyestuffs. 3,975,379, Cl. 260-240.00E.

Schnoeller, Manfred, to Siemens Aktiengesellschaft. Method of producing directly heatable hollow semiconductor bodies. 3,974,561, Cl. 29-611.000.

Schoenberg, Jules E.: *See—*
Georgoudis, Paul C.; Schoenberg, Jules E.; Ray-Chaudhuri, Dilip K.; and Puletti, Paul P., 3,975,323.

Schoonover, William C.: *See—*
Green, Dale; Erway, Duane; Condon, Robert; Schoonover, William C.; and Rowe, Norman L., 3,975,748.

Schreyer, Kenneth D., to Columbus McKinnon Corporation. Coupling link. 3,974,640, Cl. 59-85.000.

Schrock, Wilfried: *See—*
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl-Georg, 3,975,375.

Schroder, Hans-Jurgen: *See—*
Hauschild, Ulrich; Musall, Reimar; and Schroder, Hans-Jurgen, 3,975,503.

Schromm, Kurt: *See—*
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; and Danneberg, Peter, 3,975,525.

Schroter, Wolfgang: *See—*
Nickl, Josef; Muller, Erich; Schroter, Wolfgang; Haarmann, Walter; and Roch, Josef, 3,975,524.

Schubart, Rudiger; and Eholzer, Ulrich, to Bayer Aktiengesellschaft. Bis (2-benzthiazole-dithio)-N,N'-piperazines and their use as vulcanizing agents. 3,975,333, Cl. 260-79.50C.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Egli, Emil; and Landwehrkamp, Hans, 3,974,972.

Schudel, Peter: *See—*
Helminger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,975,311.

Schuele, William John: *See—*
Quinn, Robert Michael; Schuele, William John; and Unis, Richard Alan, 3,975,220.

Schuhmeir, Eugen: *See—*
Hofmann, Wilfried; Dietrich, Karl-Heinz; Rauffer, Walter; Schuhmeir, Eugen; and Kohler, Reinhard, 3,975,749.

Schultz, Albert N., Jr.: *See—*
Latham, Roy W.; and Schultz, Albert N., Jr., 3,975,731.

Schultz, Bethel F. Room status signaling system. 3,975,724, Cl. 340-286.000.

Schumacher, Bernd: *See—*
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, 3,975,607.
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, 3,975,608.

Schuster, Frank C., to Little Giant Products, Inc. Side shifter assembly for lift trucks. 3,974,927, Cl. 214-730.000.

Schuster, Joerg: *See—*
Reicheneder, Franz; Kropp, Rudolf; Amann, August; Giertz, Hubert; and Schuster, Joerg, 3,975,526.

Schwartz, Alan Asher, to G. D. Searle & Co. Interferon purification. 3,975,344, Cl. 260-112.00R.

Schwarz, Christian: *See—*
Distler, Walter; Kraus, Helmut; Schwarz, Christian; and Schmidt, Oskar, 3,975,740.

Schwarzkopf Development Corporation: *See—*
Strohmeier, Gerolf; and Bodem, Johann, 3,974,555.

SCM Corporation: *See—*
Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., 3,975,541.
McGinniss, Vincent D., 3,975,251.

Scott, William W., Jr., to Lukens Steel Company. Molten metal sampler for electroslag refining process. 3,974,698, Cl. 73-425.600.

Scribner, Richard M.: *See—*
DeFranco, Robert Jay; and Scribner, Richard M., 3,975,399.

Seeberg, Horst; and Fach, Horst, to Didier Engineering GmbH. Process and system for determining the end of a coking process. 3,975,240, Cl. 201-1.000.

Seidenberger, James W., to J. T. Baker Chemical Company. Spill control composition and use thereof. 3,975,298, Cl. 252-430.000.

Seidl, Pavel: *See—*
Rencin, Miloslav; Rod, Josef; and Seidl, Pavel, 3,974,665.

Seiler, Erhard: *See—*
Schmidt, Franz; Fahrbach, Gerhard; Schenk, Wolfgang; and Seiler, Erhard, 3,975,459.

Seiscom Delta Inc.: *See—*
Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., 3,975,636.
Klein, Emmett J., Jr.; Hubbard, Clyde W., Jr.; and Chapman, Lloyd R., 3,975,705.

Seiwell, Linda P.: *See—*
Coulson, Dale Robert; and Seiwell, Linda P., 3,975,415.

Sekiguchi, Hideto; Sone, Masao; and Sato, Mitsunori, to Japan Exlan Company Limited. Process for producing anti-pilling acrylic fiber. 3,975,486, Cl. 264-182.000.

Sekimori, Kenji: *See—*
Sagawa, Seiji; Kimura, Osamu; Sekimori, Kenji; and Ito, Fumiyuki, 3,975,417.

Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., to Continental Can Company, Inc. Can depalletizer. 3,974,922, Cl. 214-8.50K.

Semimetals, Inc.: *See—*
Ruehrwein, Robert A., 3,975,218.

Serini, Volker: *See—*
Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, 3,975,225.

Serota, Samuel. Apparatus and method for gaining access to the contents of pressurized vessels and systems. 3,974,846, Cl. 137-15.000.

Sesselmann, Dieter: *See—*
Pickert, Hansjurgen; and Sesselmann, Dieter, 3,974,785.

Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, to Montecatini Edison S.p.A. Graft polymers of vinyl chloride on unsaturated olefinic elastomers and process for the preparation thereof. 3,975,458, Cl. 260-876.00R.

Shadle, Jesse L., to Plastofilm Industries, Inc. Band saw safety guard. 3,974,724, Cl. 83-68.000.

Shaffer, Roy E., to United States of America, Army. Method of screening infra-red radiation. 3,975,292, Cl. 252-305.000.

Shaltz, Gregory P.; and Armas, Joaquin P., to Parma Industries, Inc. Two-stage fluid filter. 3,975,273, Cl. 210-74.000.

Sharp Kabushiki Kaisha: *See—*
Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,975,661.

Shatila, Mounir A.; and Beck, Roderick G., to American Potato Company. Agglomerated dehydrated potato product and method for forming a reconstituted dough-like product therefrom. 3,975,549, Cl. 426-550.000.

Shatila, Mounir A., to American Potato Company. Microbially-stable potato products and process. 3,975,551, Cl. 426-637.000.

Shaw, Howard A.; and Todhunter, John D., to Brewer, Gordon A.; and Buell, Eugene F. Flexible mobile conveyor. 3,974,907, Cl. 198-92.000.

Sheehan, Richard J.: *See—*
Boyer, Ronald J.; Stenseth, Raymond E.; and Sheehan, Richard J., 3,975,408.

Sheldon, Warren D.: *See—*
Black, Millard G.; Sheldon, Warren D.; and Cook, Dennis S., 3,974,778.

Shell Oil Company: *See—*
Davison, Sol; and Wales, Michael, 3,975,460.
Kodama, Jiro K.; Haynes, George R.; and Albert, James R., 3,975,533.

Shelmire, Jesse Bedford, Jr. Solid amphoteric skin cleanser. 3,975,313, Cl. 252-542.000.

Sherritt Gordon Mines Limited: *See—*
Kunda, Wasyl; and Huppmann, Winfried J., 3,975,217.
Van Der Meulen, Sjaak Johan; Weizenbach, Bauke; Mackiw, Vladimir N.; and Kinjerski, Theodore Andrew, 3,975,190.

Sherry, Cameron W.: *See—*
Meiel, Samuel P.; and Sherry, Cameron W., 3,974,548.

Shersher, Yakov Isaevich. Artificial hip-joint for arthroplasty. 3,974,527, Cl. 3-1.912.

Sherwood, John R., to AMF Incorporated. Synchronized produce sorting system. 3,975,262, Cl. 209-111.600.

Shibata, Norio: *See—*
Goto, Kenji; Hashiguchi, Yukihide; and Shibata, Norio, 3,974,861.

Shida, Sankichi; Hashimoto, Koji; Hirohata, Hyogo; and Honjo, Katsuhiko, to Matsushita Electric Industrial Co., Ltd. Receptacle for printed circuit board. 3,975,076, Cl. 339-17.00L.

Shimada, Satoshi: *See—*
Yamanaka, Seisuke; Kanou, Yasuo; Mifune, Tadayoshi; and Shimada, Satoshi, 3,975,760.

Shimano Industrial Company, Limited: *See—*
Kamikawa, Kiyohide, 3,974,977.
Nagano, Masashi, 3,974,707.

Shimaya, Shyozo: *See—*
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Shimizu, Atsumu: *See—*
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, 3,974,794.

Shinetsu Chemical Company: *See—*
Kitagaki, Tetsuro; Yamamoto, Akira; and Ishihara, Toshinobu, 3,975,446.

Shirland, Fred A., to Westinghouse Electric Corporation. Solar cells and method for making same. 3,975,211, Cl. 136-89.000.

Shishido, Tadao: *See—*
Ohi, Reiichi; and Shishido, Tadao, 3,975,395.

Shoemaker, Arthur H., to American Optical Corporation. Four element microscope objective. 3,975,087, Cl. 350-175.0ML.

Shoemaker, Arthur H., to American Optical Corporation. Three element eyepiece with magnification of 12X. 3,975,088, Cl. 350-175.00E.

Shomura, Takashi: *See—*
Niwa, Tomizo; Goi, Hitoshi; Shomura, Takashi; Ogawa, Yasuaki; Inouye, Shigeharu; Saito, Kazuo, deceased; and Niida, Taro, 3,975,235.

Shorette, Richard A. Light enclosure for suspended ceiling. 3,974,584, Cl. 40-130.00R.

Shorr, Melvin, to Northrop Corporation. Cascade effect blown flap. 3,974,987, Cl. 244-42.0CC.

Shupe, Russell D.: *See—*
Tate, Jack F.; Shupe, Russell D.; and Maddox, Jim, Jr., 3,975,282.

Siby, Sture: *See—*
Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, 3,975,685.

Siemens Aktiengesellschaft: *See—*
Behrens, Dieter; and Klotzsche, Heinz, 3,975,683.
Distler, Walter; Kraus, Helmut; Schwarz, Christian; and Schmidt, Oskar, 3,975,740.
Fick, Herbert, 3,975,593.
Goser, Karl, 3,975,718.
Guntersdorfer, Siegfried, 3,975,594.
Hassler, Dieter, 3,974,692.
Hertz, Walter; and Stroh, Jan, 3,975,602.
Schnoeller, Manfred, 3,974,561.
Soldner, Richard; and Rattmann, Rudolf, 3,974,682.
Winzer, Gerhard, 3,975,082.

Sigg-Grutter, Trudi: *See—*
Helminger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,975,311.

Sigmund, Jerry A., to Standard Pressed Steel Co. Tightening system. 3,974,883, Cl. 173-12.000.

Signorini, Ernesto: *See—*
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, 3,975,180.

Sigworth, Frederick J.: *See—*
Morris, Harold D.; and Sigworth, Frederick J., 3,974,699.

Sikich, Matthew John: *See—*
Mark, Viggo; and Sikich, Matthew John, 3,974,923.

Siktberg, Richard Philip; and Schiedermayer, Marvin Lee, to Lincoln Electric Company, The. Control circuit for automatic electric arc-welder. 3,975,616, Cl. 219-131.00F.

Silvis, Donahue B.; and Vargas, Edward A. Apparatus for cleaning a floor cover. 3,974,541, Cl. 15-320.000.

Simmons, John Ernest, to EMI Limited. Loading articles into bags. 3,974,625, Cl. 53-189.000.

Simplex Cutting Machine Company, Inc.: *See—*
Ellis, Emily W., 3,974,565.

Simplex Time Recorder Company: *See—*
Trischler, Gunther; and Reichert, Hartmut, 3,975,743.

Simpson, Harold H., to Sybron Corporation. Dental alloy and amalgam. 3,975,192, Cl. 75-169.000.

SKF Industrial Trading and Development Company, B.V.: *See—*
Timmer, Hendrikus J. M.; and Lazaroms, Johannes C. J., 3,974,542.

SKF Nova AB: *See—*
Nilsson, Sven Walter, 3,975,064.

Skiles, Carl L.: *See—*
Halpern, Richard L.; and Skiles, Carl L., 3,974,655.

Skinner Precision Industries, Inc.: *See—*
Redding, Robert J., 3,975,666.

Skulnick, Harvey I.: *See—*
Hunter, James H.; and Skulnick, Harvey I., 3,975,374.

Slovacek, Raymond J.: *See—*
Horn, Robert; and Slovacek, Raymond J., 3,975,622.

Smalley, Graham; and Rothwell, Eric, to Allied Colloids Limited. Process for settling red mud in the digestion of bauxite. 3,975,496, Cl. 423-122.000.

Smith, Harry: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 3,975,535.

Smith International, Inc.: *See—*
Tschirky, John E., 3,975,120.
Tschirky, John E., 3,975,121.

Smith, Jack R.; and Reed, Terry J., to Westinghouse Electric Corporation. Combined cycle electric power plant and a gas turbine having improved outlet temperature limit control. 3,974,643, Cl. 60-39.18B.

Smith, Jack R., to Westinghouse Electric Corporation. Control apparatus for matching the exhaust flow of a gas turbine employed in a combined cycle electric power generating plant to the requirements of a steam generator also employed therein. 3,974,645, Cl. 60-39.290.

Smith, John C., Jr.: *See—*
Kummins, Joel S.; and Smith, John C., Jr., 3,975,554.

Smith Kline: *See—*
Hill, David T.; and Loev, Bernard, 3,975,537.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,975,530.

Smith, Melvin E., to Phillips Petroleum Company. Geochemical exploration using isoprenoids. 3,975,157, Cl. 23-230.0EP.

Smith, Ronald H., to Solergy, Inc. Solar heating device. 3,974,824, Cl. 126-271.000.

Smith, Verity C., to Vaponics, Inc. Distillation apparatus. 3,975,241, Cl. 202-202.000.

Smith, William Novis, Jr., to Foote Mineral Company. Process for preparing butynyllithium. 3,975,453, Cl. 260-665.00R.

SmithKline Corporation: *See—*
Snader, Kenneth M.; and Willis, Chester R., 3,975,380.

Smyk, Rostyslaw R.; and Rabi, Rafat T., to Del'oto, Inc. Stannous salt catalyzed epoxy systems. 3,975,314, Cl. 260-2.0EP.

Snader, Kenneth M.; and Willis, Chester R., to SmithKline Corporation. Substituted aurones. 3,975,380, Cl. 260-240.00R.

Snam Progetti S.p.A.: *See—*
Neri, Carlo; and Perrotti, Emilio, 3,975,430.

Snodgrass, James D.: *See—*
Johnson, Theodore C.; and Snodgrass, James D., 3,975,256.

Societa' Farmaceutici Italia S.p.A.: *See—*
Arcari, Giuliana; De Micheli, Pietro; Luini, Fulvio; and Scarponi, Ugo, 3,975,389.

Societe Anonyme Francaise du Ferodo: *See—*
de Gennes, Marie Alfred Gerard, 3,974,903.
Fieni, Walter, 3,974,979.

S.A. Martin: *See—*
Stehlin, Hubert, 3,974,727.

Societe des Anciens Etablissements L. Geismar: *See—*
Huboud-Peron, Jean, 3,974,596.

Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: *See—*
Bulteau, Gerard; Acher, Jacques; and Monier, Jean-Claude, 3,975,434.

Societe Distrembal SA: *See—*
Aubert, Michel, 3,974,843.

Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM): *See—*
Lehmann, Serge, 3,975,754.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Camboulives, Andre Alphonse Mederic Leon; le Maout, Theophile Francois; Rejzner, Jacques Serge; and Vandenbroucke, Roger Alfred Jules, 3,974,649.

Societe Rhone-Progil S.A.: *See—*
Bergounhon, Rene, 3,975,131.

Societe Turripinoise de Mecanique Stumec: *See—*
Huboud-Peron, Jean, 3,974,596.

Soldner, Richard; and Rattmann, Rudolf, to Siemens Aktiengesellschaft. Ultra sound examining device. 3,974,682, Cl. 73-67.700.

Solergy, Inc.: *See—*
Smith, Ronald H., 3,974,824.

Solvay & Cie: *See—*
Gabellieri, Rodolfo; and Raganato, Carlo, 3,975,163.

Solyst, Erik R., to International Business Machines Corporation. Charge electrode for ink jet. 3,975,741, Cl. 346-75.000.

Sommovigo, Paolo: *See—*
Ramacciotti, Aldo; Repetto, Eugenio; and Sommovigo, Paolo, 3,975,577.

Sone, Masao: *See—*
Sekiguchi, Hideto; Sone, Masao; and Sato, Mitsunori, 3,975,486.

Sony Corporation: *See—*
Kamaya, Naoki, 3,975,765.
Yamanaka, Seisuke; Kanou, Yasuo; Mifune, Tadayoshi; and Shimada, Satoshi, 3,975,760.

Sorgenfrei, Jurgen: *See—*
Weber, Gerald; and Sorgenfrei, Jurgen, 3,975,714.

South African Coal, Oil & Gas Corporation Limited: *See—*
van Eeden, Stephanus Jacobus Daniel; and Pienaar, Jacobus Francois, 3,975,605.

Southgate, Robert: *See—*
Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, 3,975,383.

Southwest Research Institute: *See—*
Melton, Rosser B., Jr.; and Hubbard, Elbert M., 3,974,939.

Southwire Company: *See—*
Tate, Stanley L.; Rowland, Bobby A.; and Blackstone, Michael M., 3,975,208.

Spash, John L.; and Rottmayer, Robert, to Digital Equipment Corporation. Transducer assembly for a disc drive. 3,975,770, Cl. 360-103.000.

Speckin, Leonard A. Column mounted tool holder. 3,975,068, Cl. 312-254.000.

Spector, George: *See—*
Conn, John L.; and Spector, George, 3,974,604.

Speer, Lawrence. Method for repairing plastic-like materials. 3,975,558, Cl. 427-140.000.

Sperry Rand Corporation: *See—*
McMahon, Donald H., 3,975,711.

Speth, Sebastian, to Ruhrchemi Aktiengesellschaft. Method and apparatus for sampling a liquid stream. 3,974,697, Cl. 73-422.00R.

Spetsialnoe Konstruktorskoe Bjuro "Transnefteavtomatika": *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Spichtig AG Kunststoffwerk Steinen: *See—*
Rohner, Benedikt, 3,974,934.

Spiewak, John W., to Firestone Tire & Rubber Company, The. Process for producing aromatic polyamides from amidine derivatives of polyamide forming reactants. 3,975,331, Cl. 260-78.00R.

Sporck, Christian R., to National Semiconductor Corporation. Molded electrical device. 3,975,757, Cl. 357-72.000.
Springthorpe, Anthony John, to Northern Electric Company Limited. Monolithic light-emitting diode and modulator. 3,975,751, Cl. 357-19.000.
Staal, Gerardus B.: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,975,429.
Staats, Stanley E. Forked stakes for animal traps. 3,974,592, Cl. 43-88.000.
Stachniak, Raymond M.: *See—*
Palac, Kazimir; and Stachniak, Raymond M., 3,975,198.
Stackhouse, Wells F., to American Locker Company, Inc. Lock. 3,974,669, Cl. 70-276.000.
Stahle, Helmut: *See—*
Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, 3,975,539.
Stahmann, Mark A. Coagulation of protein from the juices of green plants by fermentation and the preservation thereof. 3,975,546, Cl. 426-49.000.
Stahnecker, Erhard: *See—*
Nintz, Eckhard; Schick, Rupert; Horacek, Heinrich; and Stahnecker, Erhard, 3,975,327.
Stal-Laval Turbin AB: *See—*
Kylberg, Gunnar, 3,974,718.
Stamer, Hans. Method of and incubator for preparing bacterial cultures. 3,975,239, Cl. 195-108.000.
Stamicarbon B.V.: *See—*
de Vrieze, Christiaan G., 3,975,326.
Nommensen, Johan P., 3,975,274.
Packbier, Mathijs W.; and Jonckers, Kees, 3,975,472.
Tiessens, Meindert; and Van Gorcom, Henricus J. M., 3,975,335.
Wassen, Willem J., 3,975,425.
Standard Oil Company (Indiana): *See—*
Holda, Eugene M.; and Lark, John C., 3,975,566.
Standard Pressed Steel Co.: *See—*
Sigmund, Jerry A., 3,974,883.
Walker, Richard A., 3,974,685.
Standard Register Company, The: *See—*
Paulson, William T.; Davidson, David M., deceased; Gilbert, L. Eldean; Gabbard, Henry; and Bemus, Richard D., 3,975,559.
Stanford, Charles O.: *See—*
Daily, Thomas E.; Stanford, Charles O.; and Hinners, William L., 3,974,573.
Stang, Micheal O. Wedge-bolted joint. 3,974,621, Cl. 52-758.00F.
Stangroom, Max, to National Convenience Stores. Method of baking a pizza using micro-wave energy. 3,975,552, Cl. 426-243.000.
Staniland, Philip Anthony; and Jarrett, Graham, to Imperial Chemical Industries Limited. Aromatic polymers of increased resistance to flow and molecular weight obtained by irradiation. 3,975,249, Cl. 204-159.140.
Stark, Edward W.: *See—*
Mader, Arthur H.; Gasiunas, Donatas V.; and Stark, Edward W., 3,975,727.
Starrett, Richard F. Contact refrigeration unit. 3,974,658, Cl. 62-60.000.
Stauffer Chemical Company: *See—*
Fancher, Llewellyn W., 3,975,419.
Stayner, Robert A., to Chevron Research Company. Wax-flux composition containing a diester of sulfomalic acid for soldering. 3,975,216, Cl. 148-23.000.
Stead, Michael; and Heap, Gordon, to Batley Controls Limited. Valve. 3,974,860, Cl. 137-625.300.
Steadman, Brian Lee, to Avon Medicals Limited. Tamper-proof seals. 3,974,938, Cl. 220-266.000.
Steadman, Ernest H. Multi-block support construction. 3,974,601, Cl. 52-86.000.
Steele, Raymond Ernest, to Kwikform Limited. Builders scaffolding. 3,975,106, Cl. 403-374.000.
Stegmeier, William J. Method utilizing a form board for securing a row of tiles in alignment along an irregular face of a swimming pool bond beam. 3,974,620, Cl. 52-747.000.
Stehlin, Hubert, to S.A. Martin. Rotary knife, assembly and machine for processing a product. 3,974,727, Cl. 83-174.000.
Stein, Reinhardt P., to American Home Products Corporation. Monoacylation of 17-hydroxy-3-alkoxygona-2,5-(10)dienes. 3,975,412, Cl. 260-397.400.
Steinbruegge, Kenneth B.: *See—*
Melamed, Nathan T.; and Steinbruegge, Kenneth B., 3,975,694.
Steiner, Josef: *See—*
Stumpp, Gerhard; Michel, Friedbert; and Steiner, Josef, 3,974,811.
Stendel, Wilhelm: *See—*
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,975,534.
Stender, Reinhard: *See—*
Schalles, Erhard; Latten, Werner; and Stender, Reinhard, 3,974,721.
Stenseth, Raymond E.: *See—*
Boyer, Ronald J.; Stenseth, Raymond E.; and Sheehan, Richard J., 3,975,408.
Stephan, Erwin A., to Eli Lilly and Company. Ethyl- and vinylbenzenes as antithromobiotic agents. 3,975,542, Cl. 424-353.000.
Stephan, Erwin A., to Eli Lilly and Company. Ethyl- and vinylbenzenes as anti-inflammatory agents. 3,975,543, Cl. 424-353.000.
Stephan, Lawrence J., to Progressive Swing Method, Inc. Golf trainer device. 3,975,024, Cl. 273-193.00R.
Stern, Donald J.: *See—*
Teranishi, Roy; and Stern, Donald J., 3,975,270.
Stevenson, Neil Arthur; and Wardell, George, to Fisons Limited. Composition. 3,975,536, Cl. 424-283.000.
Stewart & Stevenson Oiltools, Inc.: *See—*
Brock, Bill M., Jr.; Marquette, Leo Jude; and Nelson, Norman Allen, 3,974,690.
Stiegler, Jacques Paul, to Compagnie Internationale pour l'Informatique. Automatically operated magnetic tape equipment. 3,974,981, Cl. 242-182.000.
Stinson, John David: *See—*
Gray, Peter Harrison; Row, Grant David; and Stinson, John David, 3,974,942.
Stockhaus, Klaus: *See—*
Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, 3,975,368.
Stokes, Lyle S.: *See—*
Graves, Ross E.; and Stokes, Lyle S., 3,975,628.
Stoll, Max, deceased: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,975,310.
Stoll, Peter A., to Intel Corporation. Capacitive voltage converter employing CMOS switches. 3,975,671, Cl. 321-15.000.
Stoll, Suzanne, executrix: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,975,310.
Stone, Robert L., to Raymond Engineering Inc. Tape transport. 3,974,982, Cl. 242-192.000.
Stone, Wayne B., Jr. Apparatus for reducing oxidation of coffee. 3,974,758, Cl. 99-275.000.
Stoner, Jesse A., to General Electric Company. Method for attaching an end frame and another structural component of a dynamoelectric machine. 3,974,873, Cl. 164-108.000.
Storandt, Duane L. Charcoal fire starter and cooker. 3,974,821, Cl. 126-25.00B.
Stork Brabant B.V.: *See—*
Vertegaal, Jacobus Gerardus, 3,974,950.
Stralser, Bernard J. Treating sewage and recovering usable water and solids. 3,975,247, Cl. 204-152.000.
Stretanski, Joseph Anthony, to American Cyanamid Company. Polymers stabilized with an organo-nickel compound and a dialkyl pentaerythritol diphosphite. 3,975,358, Cl. 260-45.75N.
Strike, Donald P.; and Kao, Wenling, to American Home Products Corporation. 15-Substituted 11α-cyano-prostaglandins and related compounds. 3,975,421, Cl. 260-464.000.
Stroh, Jan: *See—*
Hertz, Walter; and Stroh, Jan, 3,975,602.
Strohmeier, Gerolf; and Bodem, Johann, to Schwarzkopf Development Corporation. Rolls for rolling mills and method for making same. 3,974,555, Cl. 29-132.000.
Stromberg-Carlson Corporation: *See—*
Berube, James E.; and Neumeier, Gunter F., 3,975,595.
Pommerening, Uwe A., 3,975,596.
Voise, Siegfried; Wagner, Thomas M.; and Zeitler, Walter, 3,975,597.
Strong, Gardner H. Expansion-contraction joint. 3,974,614, Cl. 52-573.000.
Strow, Lawrence Evans: *See—*
Bolth, Franklin Anderson; Crozier, Ronald David; and Strow, Lawrence Evans, 3,975,264.
Strozinski, Anthony John, to Facet Enterprises, Inc. Motor Components Division. Combination return and mesh spring-plunger pole motor. 3,974,703, Cl. 74-6.000.
Stubblefield, Fred H., Jr. Apparatus and method for repressurizing hollow valveless articles. 3,974,622, Cl. 53-7.000.
Stumpp, Gerhard; Jaggle, Gunther; Krauss, Rudolf; and Scharl, Herbert, to Robert Bosch G.m.b.H. Fuel injection system for spark plug-ignited internal combustion engines with compression of the air-fuel mixture. 3,974,809, Cl. 123-139.0AW.
Stumpp, Gerhard; Michel, Friedbert; and Steiner, Josef, to Robert Bosch G.m.b.H. Fuel injection system. 3,974,811, Cl. 123-139.0AW.
Stursberg, Bernd, to Peddinghaus, Rolf. Cutter for bar stock. 3,974,726, Cl. 83-157.000.
Suddeutsche Zucker-Aktiengesellschaft: *See—*
Munir, Mohammad; Schiweck, Hubert; Weinz, Hans-Werner; and Wurm, Fritz, 3,975,205.
Sudnishnikov, Boris Vasilievich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; and Makarov, Mikhailovich. Pneumatic percussive power tool. 3,974,885, Cl. 173-121.000.
Sugahara, Mitsuaki; Sato, Teizo; Kobayashi, Sakae; and Kanekawa, Akira, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of taking out scale from polymerization reactor. 3,975,207, Cl. 134-6.000.
Sugier, Andre: *See—*
Courty, Philippe; Sugier, Andre; and Le Page, Jean-Francois, 3,975,302.
Sugihira, Tuneo: *See—*
Terai, Akio; Tanaka, Michiya; Todorobaru, Yasuhiro; and Sugihira, Tuneo, 3,974,881.
Sugimatsu, Akihito; Yorozu, Makoto; Nomura, Tadayoshi; Yoshino, Isamu; and Yoshikawa, Hachiro, to Sanyo-Kokusaku Pulp Co., Ltd. Magnetic recording element. 3,975,569, Cl. 428-329.000.
Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., to ITL Industries, Inc. Snow plowable pavement marker. 3,975,108, Cl. 404-16.000.

Sukornick, Bernard: *See—*
Gordon, Joseph; and Sukornick, Bernard, 3,975,501.
Sullivan, Arthur Francis: *See—*
Brockett, Frank Howard, III; Philp, James E.; and Sullivan, Arthur Francis, 3,975,054.
Sulzer, Harry E., to Quaker City Gear Works, Inc. Position limiting switch assembly. 3,974,962, Cl. 235-132.00R.
Sumitomo Chemical Company: *See—*
Sagawa, Seiji; Kimura, Osamu; Sekimori, Kenji; and Ito, Fumiyuki, 3,975,417.
Sumitomo Electric Industries, Ltd.: *See—*
Kawaguchi, Munetaka; and Ueba, Yoshinobu, 3,975,571.
Sumitomo Metal Industries, Ltd.: *See—*
Okada, Masaru; and Inoue, Jun, 3,975,004.
Sumiyoshi, Masaharu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 3,974,818.
Sumner, Maurice N. Modular offshore structure system. 3,974,657, Cl. 61-50.000.
Sun Oil Company of Pennsylvania: *See—*
Lerner, Julius, 3,974,695.
Sunbeam Plastics Corporation: *See—*
Montgomery, Gary Van, 3,974,929.
Sundstrand Corporation: *See—*
Gravelle, Homer E., 3,975,065.
Superior Concrete Accessories, Inc.: *See—*
Turner, Norman G., 3,974,619.
Supreme Equipment & Systems Corporation: *See—*
Quinn, David A., 3,975,071.
Suzui, Akio; Yoshimoto, Hiroshi; and Kuri, Takeshi, to Osaka Soda Co., Ltd. Process for preparing diallyl phthalate latex. 3,975,349, Cl. 260-29.70R.
Suzuki, Chuji: *See—*
Kanatani, Yoshiharu; Ise, Masahiro; Mizukami, Etsuo; and Suzuki, Chuji, 3,975,661.
Suzuki, Mitsuo: *See—*
Fujishige, Shoei; and Suzuki, Mitsuo, 3,975,328.
Suzuki, Nobuo: *See—*
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Suzuki, Nobuo; and Tsuruta, Hideki, 3,975,441.
Suzuki, Shigeto, to Chevron Research Company. Hydrogenation of epoxides to primary alcohols. 3,975,449, Cl. 260-635.00E.
Suzuki, Yasuhiro; and Yamaguchi, Katsuhiko, to Nitto Electric Industrial Co., Ltd. Imide-modified polyester resin and wire enamel containing the imide-modified polyester resin. 3,975,330, Cl. 260-75.00N.
Svenska Rotor Maskiner Aktiebolag: *See—*
Schibbye, Lauritz Benedictus, 3,975,123.
Svensson, Torbjorn, to Linden-Alimak AB. Hose rupture valve. 3,974,852, Cl. 137-498.000.
Svoboda, Josef: *See—*
Lill, Viktor; Rossler, Ernst; Svoboda, Josef; and Weigl, Erwin, 3,975,033.
Weigl, Erwin; Rossler, Ernst; and Svoboda, Josef, 3,975,034.
Svoboda, Vlastimil; and Celechovska, Olga, to Lachema, narodni podnik. Biological diagnostic test strip. 3,975,161, Cl. 23-253.000.
Swanke, Thaddeus; Montalto, Michael S.; and Morse, John E., to Eastman Kodak Company. Web tracking apparatus. 3,974,952, Cl. 226-189.000.
Swarthout, David J.: *See—*
Jones, Robert N.; and Swarthout, David J., 3,975,306.
Sweet, Ervin Jack, to United States of America, Army. Combustion liner swirler. 3,975,141, Cl. 431-352.000.
Swift & Company: *See—*
Ramirez, Ernest R., 3,975,269.
Swimmer, Erika: *See—*
Turoff, Allan, 3,975,223.
Sybron Corporation: *See—*
Simpson, Harold H., 3,975,192.
Sycor, Inc.: *See—*
Helbers, Jan Hendrik, 3,975,774.
Synestructics, Inc.: *See—*
Pearce, Peter J., 3,974,600.
Syntex Corporation: *See—*
Alvarez, Francisco, 3,975,432.
Syntex (U.S.A.) Inc.: *See—*
Nelson, Peter H.; and Untch, Karl G., 3,975,540.
Patterson, John W., 3,975,378.
Untch, Karl G., 3,975,427.
Systron Donner Corporation: *See—*
Morris, Harold D.; and Sigworth, Frederick J., 3,974,699.
Syva Company: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 3,975,237.
Szabo, Susana S.: *See—*
Berg, Betsy Helen; and Szabo, Susana S., 3,975,151.
Szeberenyi, Szaholes: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,975,390.
Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,975,390.
T.S.W.S., Inc.: *See—*
Lusk, Joe F.; and Rood, William H., 3,975,708.
Tac Technical Instrument Corporation: *See—*
Beck, Kenneth H., 3,975,261.
Tadini, Costantino: *See—*
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, 3,975,607.
Tago, Yoshimitsu: *See—*
Yasunaga, Yoshikazu; Hokao, Zenjiro; Sakusabe, Koji; and Tago, Yoshimitsu, 3,975,228.
Tai, Wun Ten; and Phillips, Kenneth G., to Nalco Chemical Company. Ionene conductive polymers and resulting electrographic printing bases. 3,975,305, Cl. 252-500.000.
Takahashi, Hisateru: *See—*
Morikawa, Takashi; Kihara, Hidetoshi; Urifu, Tohru; and Takahashi, Hisateru, 3,974,635.
Takahashi, Yasuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide angle photographic lens. 3,975,091, Cl. 350-214.000.
Takami, Norimitsu: *See—*
Kakitani, Shigeyuki; Kishi, Tadashi; Hirao, Takehiko; Takami, Norimitsu; Shimizu, Atsumu; Outeki, Keiichi; and Fujimoto, Masato, 3,974,794.
Takashima, Masaru, to Aikoh Co., Ltd. Moulding for the heat retention of feeder head in casting molten metals. 3,975,200, Cl. 106-38.220.
Takeda Chemical Industries, Inc.: *See—*
Kamikado, Toshiya; Kuragano, Takashi; Konishi, Kazuo; Sato, Yasuo; and Nagano, Masayoshi, 3,975,538.
Takeda, Hideomi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Structures for detecting focal adjustment of optical systems. 3,975,631, Cl. 250-211.00R.
Takeda, Masahiro: *See—*
Murakami, Katsuhiko; Ikeda, Tetsuo; Takeda, Masahiro; Kazama, Osamu; and Nishinaka, Hidaka, 3,974,888.
Takei, Akira, to Matsumoto, Keishin, Director-General, Agency of Industrial Science and Technology. Bootstrap circuit. 3,975,647, Cl. 307-228.000.
Takeshita, Kano: *See—*
Ito, Matsutoshi; Nishikawa, Tatsuo; and Takeshita, Kano, 3,975,707.
Takeuchi, Hiroshi: *See—*
Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, 3,974,617.
Takeuchi, Osamu, to Rank Xerox Ltd. Toner dispenser. 3,974,944, Cl. 222-197.000.
Takeuchi, Tomio: *See—*
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,975,366.
Takeuchi, Yuji: *See—*
Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, 3,974,617.
Talarico, Orlando N.: *See—*
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., 3,974,529.
Tamada, Shigeharu: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tanimura, Kaoru; and Tamada, Shigeharu, 3,975,391.
Tamaru, Kenzi: *See—*
Ichikawa, Masaru; Tanaka, Eiji; and Tamaru, Kenzi, 3,975,454.
Tan, Yoichi; and Hashimoto, Hiromi, to Nippon Electric Company, Ltd. Baseband signal switching arrangement for diversity reception in PCM radio communication system. 3,975,687, Cl. 325-304.000.
Tanaka, Eiji: *See—*
Ichikawa, Masaru; Tanaka, Eiji; and Tamaru, Kenzi, 3,975,454.
Tanaka, Junzo; Matsushima, Haruo; and Hatagawa, Toyotsugu, to Matsushita Electric Industrial Co., Ltd. Microwave oven with uniform electric field distribution. 3,975,606, Cl. 219-10.55F.
Tanaka, Masaaki: *See—*
Nohira, Hidetaka; and Tanaka, Masaaki, 3,974,807.
Tanaka, Michiya: *See—*
Terai, Akio; Tanaka, Michiya; Todorobaru, Yasuhiro; and Sugihira, Tuneo, 3,974,881.
Tanaka, Tadashi: *See—*
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, 3,975,242.
Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 3,974,818.
Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 3,974,818.
Tani, Tsutomu: *See—*
Kawakami, Takeshi; Tani, Tsutomu; Ishikawa, Takatoshi; and Hirabayashi, Syoji, 3,975,653.
Taniguchi, Hiroshi; and Arimura, Ichiro, to Matsushita Electric Industrial Co., Ltd. Color killer circuit system video tape recorder. 3,975,759, Cl. 358-4.000.
Taniguchi, Hiroshi: *See—*
Kobayashi, Fukashi; Taniguchi, Hiroshi; and Kanai, Kenji, 3,975,764.
Tanimura, Kaoru: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tanimura, Kaoru; and Tamada, Shigeharu, 3,975,391.
Tate, George W., Jr., to Clegg, Giles C., Jr.; and Lynn, John R., part interest to each. Means for preventing fogging of optical aids used by the wearer of a surgical mask. 3,974,829, Cl. 128-146.200.

Tate, Jack F.; and Maddox, Jim, Jr., to Texaco Inc. Method for treating scale. 3,975,281, Cl. 252-180.000.

Tate, Jack F.; Shupe, Russell D.; and Maddox, Jim, Jr., to Texaco Inc. Composition and method for treating scale. 3,975,282, Cl. 252-180.000.

Tate, Oliver C.: *See—*
Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., 3,974,922.

Tate, Stanley L.; Rowland, Bobby A.; and Blackstone, Michael M., to Southwire Company. Method of selectively recovering vinyl halide insulation from insulated wire scrap. 3,975,208, Cl. 134-10.000.

Tatsuta, Taiji: *See—*
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Taube, Werner: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

Taudt, Heinz; and Gast, Uwe, to Dr. -Ing. Rudolf Hell GmbH. Method and arrangement for the avoidance of errors during the reproduction of an image pattern. 3,975,761, Cl. 358-78.000.

Taylor, Benjamin R., to United States of America, America. Method and apparatus for improving the accuracy of measuring the length of a gaging standard by laser interferometer means. 3,975,100, Cl. 356-106.00R.

Taylor, Gregg W., to A.H.P., Inc. Analysis of gentian violet residue in tissue. 3,975,158, Cl. 23-230.00B.

Taylor, Julian S. Downhole fluid flow regulator. 3,974,876, Cl. 166-65.00R.

Taylor, Leonard Harold, to Perkin-Elmer Limited. Optical null apparatus. 3,975,099, Cl. 356-89.000.

Taylor, Paul J.: *See—*
Burgess, Glenn A.; and Taylor, Paul J., 3,974,752.

Taylor, Richard E.: *See—*
McCullough, Lester E.; and Taylor, Richard E., 3,975,735.

Technicon Instruments Corporation: *See—*
Mader, Arthur H.; Gasiunas, Donatas V.; and Stark, Edward W., 3,975,727.

Tecumseh Products Company: *See—*
Farr, James B., 3,974,660.

Tee Nee Trailer Company: *See—*
Ullman, Myron E., Jr., 3,974,924.

Teijin Limited: *See—*
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Suzuki, Nobuo; and Tsuruta, Hideki, 3,975,441.
Ono, Tomoyoshi; and Matsuguma, Yoshihiko, 3,975,570.

Teledyne Industries, Inc.: *See—*
Erdley, Harold F., 3,974,701.

Tenaud, Jean: *See—*
Bertrand, Raymond; Tenaud, Jean; and Grabowski, Rene, 3,974,970.

Tennessee Valley Authority: *See—*
McCullough, John F.; and Frederick, Leland L., 3,975,178.

Terai, Akio; Tanaka, Michiya; Todorobaru, Yasuhiro; and Sugihira, Tuneo, to Kabushiki Kaisha Komatsu Seisakusho. Bulldozer blade mounting. 3,974,881, Cl. 172-803.000.

Teramachi, Toshiyuki: *See—*
Matsuda, Shozo; Tanaka, Tadashi; Oka, Joji; Ayusawa, Saburo; Iwasaki, Kiyotoshi; Teramachi, Toshiyuki; and Miyazono, Toshitake, 3,975,242.

Teranishi, Roy; and Stern, Donald J., to United States of America, Agriculture. Process for recovering usable olive-processing liquor from olive-processing waste solution. 3,975,270, Cl. 210-53.000.

Tesco Engineering Company: *See—*
Webb, Anthony M., 3,974,855.

Tessenderlo Chemie S.A.: *See—*
Delaunois, Yvon; and Wilante, Claude, 3,975,448.

Tetro, Richard S.: *See—*
Erdody, Robert G.; Harmon, Paul E.; and Tetro, Richard S., 3,974,723.

Texaco Exploration Canada Ltd.: *See—*
Redford, David A., 3,974,877.

Texaco Inc.: *See—*
Schlicht, Raymond C.; and McCoy, Frederic C., 3,975,387.
Tate, Jack F.; and Maddox, Jim, Jr., 3,975,281.
Tate, Jack F.; Shupe, Russell D.; and Maddox, Jim, Jr., 3,975,282.

Texas Instruments Incorporated: *See—*
Carpenter, Horace G., 3,975,702.
Pimentel, Daniel R., 3,974,844.

Thein, San: *See—*
Henze, Walter J.; and Thein, San, 3,974,589.

Thepaut, Pierre, to Lignes Telegraphiques et Telephoniques. Active frequency filter cells. 3,975,691, Cl. 330-107.000.

Thiokol Corporation: *See—*
Pelham, Joseph E.; and La Haye, Frank W., 3,974,772.
Villa, Jose L., 3,975,316.

Thomanek, Franz Rudolf, to Bolkow Gesellschaft mit beschrankter Haftung. Splinter warhead for guided flying bodies for combating aerial targets. 3,974,771, Cl. 102-67.000.

Thomas, Klaus: *See—*
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, 3,975,527.

Thomas, Marcia R.: *See—*
Kraft, Patricia J.; Thomas, Marcia R.; and Kraft, Larry A., 3,975,156.

Thomas, Walter N. Combination key ring and note holder device. 3,974,543, Cl. 24-67.110.

Thompson, Laurence: *See—*
Davies, James Francis; Gilbert, Philip Alan; and Thompson, Laurence, 3,975,312.

Thomson-CSF: *See—*
Billottet, Henri; and Fechner, Patrice, 3,974,740.
Georgel, Jean; and Vilain, Maurice, 3,974,737.
Kantorowicz, Gerard, 3,975,696.
Merenda, Pierre; and Reymond, Jean Claude, 3,975,659.

Thornburg, David D., to Xerox Corporation. Stable non-crystalline material for switching devices. 3,975,755, Cl. 357-2.000.

Three Sisters Ranch Enterprise: *See—*
Faulstich, George W., 3,974,932.

Tiedemann, Hugo: *See—*
Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,975,398.

Tiessens, Meindert; and Van Gorcom, Henricus J. M., to Stamicarbon B.V. Sulphurcurable polymer of ethylene and at least one other α-alkene with reduced cold flow properties. 3,975,335, Cl. 526-283.000.

Tigner, Reuben A.; and Mounts, Lewis S., to Dow Chemical Company, The. Method for forming hollow articles from thermoplastic sheeting or film using an expandable plug. 3,975,493, Cl. 264-292.000.

Tiliander, Gosta Ador Evert, to Kommanditbolaget United Stirling (Sweden) AB & Co. Mechanical power transmission assembly. 3,974,719, Cl. 74-810.000.

Tilt-A-Bed Corporation, The: *See—*
Johnson, Clarence R.; Kidder, Jay T.; and Talarico, Orlando N., 3,974,529.

Time Computer, Inc.: *See—*
Bergey, John M.; McCullough, Robert E.; and O'Connor, Arthur H., 3,974,637.

Timex Corporation: *See—*
Leibowitz, Marshall, 3,975,086.

Timmer, Hendrikus J. M.; and Lazaroms, Johannes C. J., to SKF Industrial Trading and Development Company, B.V. Locking device for a castorwheel fork. 3,974,542, Cl. 16-35.00R.

Timofeev, Boris Petrovich: *See—*
Fournier, Pierre; Legleye, Andre Jules; Colle, Pierre; Michaut, Claude; Timofeev, Boris Petrovich; Alexandrov, Adolf Moritsovich; Balaian, Ruben Dzhangirovich; Patik, Leonid Ozerovich; Berezovsky, Victor Leontjevich; and Matzkin, Leonid Arkadjevich, 3,974,864.

Tobey, Morley C., Jr.; Giuliani, David J.; and Ashkin, Peter B., to Hewlett-Packard Company. Flat-band voltage reference. 3,975,648, Cl. 307-297.000.

Toda, Toshimasa: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.

Todhunter, John D.: *See—*
Shaw, Howard A.; and Todhunter, John D., 3,974,907.

Todorobaru, Yasuhiro: *See—*
Terai, Akio; Tanaka, Michiya; Todorobaru, Yasuhiro; and Sugihira, Tuneo, 3,974,881.

Tokuno, Masateru, to Rengo Co., Ltd. Board piling apparatus. 3,974,921, Cl. 214-7.000.

Tokyo Sharyo Seizo Kabushiki Kaisha: *See—*
Tominaga, Hiroshi, 3,974,675.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Sano, Shunichi; and Kasahara, Kohichi, 3,975,766.
Yamada, Tatsuya; Kawashima, Toshihide; and Oozeki, Takashi, 3,975,085.

Tominaga, Hiroshi, to Tokyo Sharyo Seizo Kabushiki Kaisha. Molding device. 3,974,675, Cl. 72-56.000.

Tominaga, Makoto; Takeuchi, Yuji; Kimura, Takanori; Nakano, Shinya; Karasuno, Nobumi; and Takeuchi, Hiroshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Double shell tank construction method. 3,974,617, Cl. 52-741.000.

Toohey, Raymond F., to Ford Motor Company. Multi-stroke parking brake control. 3,974,713, Cl. 74-512.000.

Toray Industries, Inc.: *See—*
Okada, Reisuke; Okuno, Hiroshi; and Fukama, Toshio, 3,975,484.

Torelli, Vesperto: *See—*
Derible, Pierre Henri; Torelli, Vesperto; and Dumont, Claude, 3,975,529.

Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 3,975,390.

Toth, Charles V., to Westinghouse Air Brake Company. Fail-safe opto-electronic phase inverting circuits. 3,975,643, Cl. 250-551.000.

Toth, Edit; Torley, Jozsef; Palosi, Eva; Szeberenyi, Szaholes; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, to Richter Gedeon Vegyeszeti Gyar Rt. N-methyl substituted piperazino nitrobenzophenones and a process for the preparation thereof. 3,975,390, Cl. 260-268.0PH.

Toth, Maria; and Browne, Frank L., to General Signal Corporation. Explosion proof and watertight enclosure with inspectable means for verifying validity of reclosure. 3,974,933, Cl. 220-3.800.

Toth, Tibor Endre; and Hardwick, Steven Finn, to Union Carbide Corporation. Electroslag welding speed control. 3,975,614, Cl. 219-126.000.
Toyo Musen Co. Ltd.: *See—*
Sasano, Mitsuharu, 3,974,704.
Toyo Seikan Kaisha Limited: *See—*
Hirata, Sadao; Yamada, Muneki; and Kishimoto, Akira, 3,975,463.
Toyoda, Kenji, to Nippon Kogaku K.K. Off-photometric-range indicator for exposure meter. 3,975,747, Cl. 354-60.00E.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji; Hashiguchi, Yukihide; and Shibata, Norio, 3,974,861.
Mizutani, Kunihiko; Aoyama, Takami; and Kawamura, Kazuhiro, 3,975,125.
Nohira, Hidetaka, 3,974,806.
Nohira, Hidetaka; and Tanaka, Masaaki, 3,974,807.
Trane Company, The: *See—*
McNabney, John C., 3,974,859.
Tranquilla, Michael N.: *See—*
Kraatz, Gerald A.; Godsen, Ronald A.; Gunner, Herbert M., Jr.; and Tranquilla, Michael N., 3,974,787.
Trapasso, Louis E., to Celanese Corporation. Water in oil emulsion process for preparing gel-free polyelectrolyte particles. 3,975,341, Cl. 526-303.000.
Traunecker, Werner: *See—*
Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, 3,975,539.
Treese, Willard E.: *See—*
Elco, Richard A.; Bauer, James A.; and Treese, Willard E., 3,975,254.
Trischler, Gunther; and Reichert, Hartmut, to Simplex Time Recorder Company. Time registration device for the recordation of presence or work time. 3,975,743, Cl. 346-91.000.
Tritenne, Claude. Method of making synthetic-resin target pigeon. 3,975,494, Cl. 264-329.000.
Troffkin, Howard Julian, to United States of America, Army. Gelled acrylic polymer. 3,975,166, Cl. 44-7.00D.
Troyer, Lloyd E.: *See—*
Minogue, Robert W.; and Troyer, Lloyd E., 3,974,552.
TRW Inc.: *See—*
Ford, David Julian, 3,975,582.
Gordon, Stanley H., 3,975,611.
Jones, Robert J., 3,975,363.
Tschirky, John E., to Smith International, Inc. Wafer elements for progressing cavity stators. 3,975,120, Cl. 418-48.000.
Tschirky, John E., to Smith International, Inc. Wafer elements for progressing cavity stators. 3,975,121, Cl. 418-48.000.
Tsubokawa, Yoshitoki: *See—*
Fujisaki, Yoshinori; Matsuda, Yoshio; and Tsubokawa, Yoshitoki, 3,974,550.
Tsubota, Katsuya; Motani, Shigeru; Hasue, Tatsuo; and Nijima, Yasuhiro, to Kanegafuchi Chemical Industries Co., Ltd. Process of producing vinyi chloride polymers. 3,975,338, Cl. 526-345.000.
Tsukino, Yoshio, to Dai Nippon Printing Company Limited. Machine for manufacturing square bags of thermoplastic film. 3,974,747, Cl. 93-8.0VB.
Tsuruta, Hideki: *See—*
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Suzuki, Nobuo; and Tsuruta, Hideki, 3,975,441.
Tuckey, Charles H., to Walbro Corporation. Mount for carburetors. 3,975,468, Cl. 261-65.000.
Tullen Industries Limited: *See—*
Hough, John A., 3,974,564.
Tullis, Kay Jeanne; and Krolick, Robert Stanley. Convertible suitcase. 3,974,898, Cl. 190-3.000.
Tummala, Rao Ramamohana: *See—*
Foster, Betty Jane; Langston, Perry Robert, Jr.; and Tummala, Rao Ramamohana, 3,975,175.
Tupitsyn, Konstantin Konstantinovich: *See—*
Sudnishnikov, Boris Vasilevich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; and Makarov, Mikhailovich, 3,974,885.
Tupitsyn, Sergei Konstantinovich: *See—*
Sudnishnikov, Boris Vasilievich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; and Makarov, Mikhailovich, 3,974,885.
Turner, Norman G., to Superior Concrete Accessories, Inc. Alignment clip for reglets. 3,974,619, Cl. 52-726.000.
Turoff, Allan, to Swimmer, Erika, a part interest. Textured painting and method. 3,975,223, Cl. 156-85.000.
Tyler, Hugh Jean, to Robertshaw Controls Company. Electronic damper motor control. 3,975,669, Cl. 318-624.000.
Tyson, James S.: *See—*
Van Anda, James B.; and Tyson, James S., 3,975,699.
Uchino, Kenju, to Kabushiki Kaisha Mitutoyo Seisakusho. Indicator for measuring apparatus. 3,974,570, Cl. 33-147.00T.
Uda, Toshio, to Niles Parts Co., Ltd. Illuminated electric cigar lighter. 3,975,619, Cl. 219-269.000.
Uddeholms Aktiebolag: *See—*
Broddevall, Bengt Gunnar, 3,975,268.
Ueba, Yoshinobu: *See—*
Kawaguchi, Munetaka; and Ueba, Yoshinobu, 3,975,571.
Ueda, Yoshihiko: *See—*
Fukuda, Yoshiharu; and Ueda, Yoshihiko, 3,975,148.
Ueeda, Ryuhei, to Kuraray Co., Ltd. Method for producing maleic anhydride. 3,975,407, Cl. 260-346.80A.
Ullman, Edwin F.: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 3,975,237.
Ullman, Myron E., Jr., to Tee Nee Trailer Company. Boat trailer. 3,974,924, Cl. 214-84.000.
Ullmann, Werner; Ferroni, Bernardo; Derighetti, Renato; Schumacher, Bernd; Mattei, Silvano; and Tadini, Costantino, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Method and apparatus for controlling an electroerosion machining operation. 3,975,607, Cl. 219-69.00M.
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Method and apparatus for regulating the gap distance in electroerosin machining. 3,975,608, Cl. 219-69.0NN.
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for the production of new pepstatins having anti-pepsin activity. 3,975,366, Cl. 260-112.50R.
Union Carbide Corporation: *See—*
Elbert, Raymond John; and Butcher, Alan De Vere, 3,975,165.
Mulvaney, William P., 3,975,473.
Rudness, Robert G., 3,975,568.
Toth, Tibor Endre; and Hardwick, Steven Finn, 3,975,614.
Union Special Corporation: *See—*
Kraatz, Gerald A.; Godsen, Ronald A.; Gunner, Herbert M., Jr.; and Tranquilla, Michael N., 3,974,787.
Unis, Richard Alan: *See—*
Quinn, Robert Michael; Schuele, William John; and Unis, Richard Alan, 3,975,220.
Unit Rig & Equipment Co.: *See—*
Satterwhite, Charles R., 3,974,580.
United Industrial Syndicate, Inc.: *See—*
Keim, Karl H., 3,975,132.
United Kingdom Atomic Energy Authority: *See—*
Martin, Roger, 3,974,683.
United States Gypsum Company: *See—*
Balinski, Henry A., 3,974,607.
Lane, Marvin K.; and Anderson, Winton C., 3,975,320.
United States of America
Agriculture: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,975,560.
Harper, Robert J., Jr.; Bruno, Joseph S.; Blanchard, Eugene J.; and Gautreaux, Gloria A., 3,975,152.
Harper, Robert J., Jr.; Gautreaux, Gloria A.; and Bruno, Joseph S., 3,975,154.
Jacks, Thomas J.; Barker, Robert H.; and Hensarling, Thomas P., 3,975,343.
Kullman, Russell M. H.; and Reinhardt, Robert M., 3,975,370.
Teranishi, Roy; and Stern, Donald J., 3,975,270.
Air Force: *See—*
Barry, James D.; and Freedman, Paul M., 3,975,693.
Bliamptis, Emmanuel E., 3,975,676.
Green, Dale; Erway, Duane; Condon, Robert; Schoonover, William C.; and Rowe, Norman L., 3,975,748.
Kay, Darrell R., 3,975,624.
Kovar, Robert F.; and Arnold, Fred E., 3,975,444.
Levitt, Barry N.; Crocker, Thomas H.; and Chapman, Everett E., 3,975,625.
Mazdiyasni, Khodabakhsh S.; and Schaper, Barbara J., 3,975,416.
Pelton, Edward L.; and Munk, Benedikt A., 3,975,738.
Van Anda, James B.; and Tyson, James S., 3,975,699.
Warnock, Don R., 3,975,210.
America: *See—*
Taylor, Benjamin R., 3,975,100.
Army: *See—*
Chow, Sen-Te; and Pupich, John J., 3,975,586.
F'Geppert, Erwin, 3,974,708.
Hartman, Richard L., 3,975,695.
Jones, Howard S., Jr.; and Reggia, Frank, 3,975,737.
Lanigan, Daniel J.; and Cohen, Marvin M., 3,975,756.
Redman, Charles M., 3,975,698.
Rongus, Leo P., 3,974,773.
Schaffner, Joseph G.; Werner, Joseph A.; and Klein, Jacob, 3,974,774.
Shaffer, Roy E., 3,975,292.
Sweet, Ervin Jack, 3,975,141.
Troffkin, Howard Julian, 3,975,166.
Energy Research and Development Administration: *See—*
Wende, Charles W. J., 3,975,233.
Navy: *See—*
Anderson, Richard C., 3,975,290.
Brodersen, Rolf K., 3,974,702.
Campbell, John M.; and Oestreich, James W., 3,974,985.
Davis, Sheridan; and Cheever, Donald C., 3,975,579.
Holt, Lloyd J.; and Panlaqui, Clayton, 3,974,990.
Transportation: *See—*
Ewen, Harold I.; and Haroules, George G., 3,975,736.
U.S. Philips Corporation: *See—*
Beun, Matthijs; and Reijnierse, Pieter, 3,975,709.
Kunert, Heinz-Peter, 3,975,642.
Van Esdonk, Johannes; Hornman, Johannes Petrus; Bluekens, Antonius Matheus Johanna; and Mattheij, Mathieu Martinus Maria Petrus, 3,974,583.
van Heusden, Sybrandus, 3,975,159.

United States Steel Corporation: *See—*
Abarotin, Eugene V.; and Buckino, Michael A., 3,975,045.
Bole, Claude E., 3,975,272.
Goetzman, Harold E., 3,975,182.
McNeil, Thomas Karl, 3,974,689.
Pringle, William L., 3,974,897.
Urbank, Stanley T., 3,974,594.

United States Surgical Corporation: *See—*
Johanson, Donald L., 3,975,599.

United Technologies Corporation: *See—*
Allen, Marvin Martin; Miller, John Alois; and Woodings, Bruce Edward, 3,975,219.
Bergquist, Everett John; and Jennings, Lawrence Joseph, 3,975,245.
Brown, Henry Bispham; and DeTolla, Francis Louis, 3,975,112.
Kepler, Charles Edward, 3,974,648.
Lewis, George D.; and Garrison, Gary D., 3,974,647.
Markowski, Stanley J.; and Reilly, Richard S., 3,974,646.

Universal Electric Company: *See—*
Dryburgh, Paul E., 3,975,654.

University of Illinois Foundation: *See—*
Long, David M., Jr., 3,975,512.

University of Virginia: *See—*
Gainer, John L., 3,975,519.

University of Waterloo, The: *See—*
Young, Murray Moo, 3,975,236.

Untch, Karl G., to Syntex (U.S.A.) Inc. Method for preparation of (d1)-13-substituted sulfinyl-prostaglandin-like compounds. 3,975,427, Cl. 260-470.000.

Untch, Karl G.: *See—*
Nelson, Peter H.; and Untch, Karl G., 3,975,540.

Upjohn Company, The: *See—*
Gish, Duane T.; Gray, Gary D.; and Wechter, William J., 3,975,367.
Hunter, James H.; and Skulnick, Harvey I., 3,975,374.
Lednicer, Daniel; and Nishizawa, Edward E., 3,975,371.
Lincoln, Frank H., Jr.; Pike, John E.; and Youngdale, Gilbert A., 3,975,404.
White, David R., 3,975,431.
Yankee, Ernest W., 3,975,426.

Upton, Lee O., to American Optical Corporation. Photochromic multifocal lenses. 3,975,092, Cl. 351-164.000.

Upton, Lee O., to American Optical Corporation. Photochromic multifocal lenses. 3,975,093, Cl. 351-164.000.

Urbank, Stanley T., to United States Steel Corporation. Elevator tee deburring device. 3,974,594, Cl. 51-3.000.

Urch, Harvey M.: *See—*
Wenger, Jerry A.; Urch, Harvey M.; and Boeddeker, David R., 3,974,894.

Urifu, Tohru: *See—*
Morikawa, Takashi; Kihara, Hidetoshi; Urifu, Tohru; and Takahashi, Hisateru, 3,974,635.

Urokohara, Tomio: *See—*
Abe, Michio; and Urokohara, Tomio, 3,974,869.

USM Corporation: *See—*
Meyer, Engelbert A., 3,975,008.

V-M Corporation: *See—*
Hammond, Robert J., 3,975,652.

V-Mark Automation Ltd.: *See—*
Kline, Edward, 3,975,227.

Vail, Sidney L.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,975,560.

Valvassori, Alberto: *See—*
Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, 3,975,458.

Van Anda, James B.; and Tyson, James S., to United States of America, Air Force. Linear roll-off filter network. 3,975,699, Cl. 333-70.00R.

Van Baasbank, Pieter; Flendrig, Hubertus A.; and De Vries, Hilbert, to N.V. Nederlandse Gasunie. Down-draught deflector-draught interrupter. 3,974,757, Cl. 98-119.000.

Vandebult, Jan: *See—*
Martens, Henry J.; and Vandebult, Jan, 3,974,581.

Vandegriff, Richard K., to Vantage Construction Company Inc. Concrete wall bracing method and apparatus. 3,974,603, Cl. 52-166.000.

van den Bosch, Francois J. G. Spectroscopical method and apparatus using TV scanning techniques. 3,975,762, Cl. 358-81.000.

Vandenbroucke, Roger Alfred Jules: *See—*
Camboulives, Andre Alphonse Mederic Leon; le Maout, Theophile Francois; Rejzner, Jacques Serge; and Vandenbroucke, Roger Alfred Jules, 3,974,649.

van der Lely, Cornelis. Mowing machine. 3,974,630, Cl. 56-295.000.

Van der Lely, Cornelis. Collection of crop and like materials. 3,974,632, Cl. 56-341.000.

Van Der Meulen, Sjaak Johan; Weizenbach, Bauke; Mackiw, Vladimir N.; and Kinjerski, Theodore Andrew, to Sherritt Gordon Mines Limited. Hydrometallurgical treatment of nickel and copper bearing intermediates. 3,975,190, Cl. 75-101.00R.

Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., to Lummus Industries, Inc. Process for baling fibers. 3,974,763, Cl. 100-35.000.

van Eeden, Stephanus Jacobus Daniel; and Pienaar, Jacobus Francois, to South African Coal, Oil & Gas Corporation Limited. Particulate material supply detectors. 3,975,605, Cl. 200-61.210.

Van Engeland, Jozef Leonard; and Willem, Arnold August, to AGFA-GEVAERT N.V. Process and apparatus for forming electrostatic charge patterns. 3,975,626, Cl. 250-315.00A.

Van Esdonk, Johannes; Hornman, Johannes Petrus; Bluekens, Antonius Matheus Johanna; and Mattheij, Mathieu Martinus Maria Petrus, to U.S. Philips Corporation. Picture display panel. 3,974,583, Cl. 40-130.00E.

Van Gompel, James J., to Brammall, Inc. Snap ring lock seal. 3,975,040, Cl. 292-318.000.

Van Gorcom, Henricus J. M.: *See—*
Tiessens, Meindert; and Van Gorcom, Henricus J. M., 3,975,335.

van Heusden, Sybrandus, to U.S. Philips Corporation. Method of and apparatus for determining the ozone contents of gas mixtures. 3,975,159, Cl. 23-232.00E.

VanLeuven, Robert W.: *See—*
Blom, Gerald E.; and VanLeuven, Robert W., 3,974,588.

Van Mastrigt, Max, to W. C. Dillon & Co., Inc. Extensometer for tensile tester. 3,974,686, Cl. 73-95.000.

Vann, William P.; and Yaverbaum, Sidney, to Corning Glass Works. Solid phase radioimmunoassay. 3,975,511, Cl. 424-1.500.

Van Pelt, Verona L. Fitted pillow case. 3,974,531, Cl. 5-339.000.

Vantage Construction Company Inc.: *See—*
Vandegriff, Richard K., 3,974,603.

Van Vliet, Edward; Fendler, George W.; and Himmelberger, Lynn, to Fluid Energy Processing & Equipment Co. Centrifugal drying mill. 3,974,574, Cl. 34-57.00E.

Vaponics, Inc.: *See—*
Smith, Verity C., 3,975,241.

Vargas, Edward A.: *See—*
Silvis, Donahue B.; and Vargas, Edward A., 3,974,541.

Varian Associates: *See—*
Munk, Miner N., 3,975,104.

VCA Corporation: *See—*
Kruck, Ralph E., 3,974,832.

VEB Leuna-Werke "Walter Ulbricht": *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

Vedamuthu, Ebenezer R., to Microlife Technics, Inc. Stabilizing agents for frozen lactic acid producing bacteria compositions. 3,975,545, Cl. 426-40.000.

Veitch, George Bryan Austin: *See—*
Harper, Norman James; and Veitch, George Bryan Austin, 3,975,443.

Venendaal, Robert G.: *See—*
Eberle, Arthur C.; Venendaal, Robert G.; and Munk, William D., 3,974,694.

Vering, Antonius; and Loffler, Bernhard, to Polysius AG. Rotary kiln. 3,975,147, Cl. 432-80.000.

Vernaleken, Hugo: *See—*
Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, 3,975,225.

Vertegaal, Jacobus Gerardus, to Stork Brabant B.V. Apparatus for dealing with horizontal bars. 3,974,950, Cl. 226-107.000.

Victor Company of Japan, Limited: *See—*
Kitamura, Masatsugu, 3,975,763.

Vilain, Maurice: *See—*
Georgel, Jean; and Vilain, Maurice, 3,974,737.

Villa, Jose L., to Thiokol Corporation. Curing liquid polyurethane prepolymers. 3,975,316, Cl. 260-2.5AK.

Vinci, Fernando; and Morandi, Dino, to Filli S.p.A. Drive unit in circular hosiery machines for a dial with plate shift clutch. 3,974,663, Cl. 66-26.000.

Violet, John L., to General Craft Supplies. Candle mold. 3,974,996, Cl. 249-112.000.

Viteci S.A.: *See—*
Papelard, Michel Paul, 3,975,591.

Vogel, Charles B. Board game apparatus. 3,975,020, Cl. 273-131.0AB.

Vogel, Peter: *See—*
Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, 3,975,398.

Vogt, Josef: *See—*
Wulff, Gunther; and Vogt, Josef, 3,975,613.

Voise, Siegfried; Wagner, Thomas M.; and Zeitler, Walter, to Stromberg-Carlson Corporation. Call queue release control circuit. 3,975,597, Cl. 179-27.00D.

von der Linde, Dietrich: *See—*
Glass, Alastair Malcolm; and von der Linde, Dietrich, 3,975,632.

Vulcan Materials Company: *See—*
Christena, Ray C., 3,975,348.

Vysoka skola chemicko-technologicka: *See—*
Zdarsky, Josef; Rehor, Jan; and Bretschneider, Rudolf, 3,975,204.

W. C. Dillon & Co., Inc.: *See—*
Van Mastrigt, Max, 3,974,686.

W. S. Rockwell Company: *See—*
Mirto, Matthew, Jr., 3,974,654.

Wack, Frank: *See—*
Domaracki, John F.; McBride, Leonard M.; and Wack, Frank, 3,974,928.

Wagner, Thomas M.: *See—*
Voise, Siegfried; Wagner, Thomas M.; and Zeitler, Walter, 3,975,597.

Wahlstedt, Robert L.; Rasmussen, Robert F.; and Johnson, Lee W., to Reel Precision Maufacturing Corporation. Magnetic spring grip device. 3,974,902, Cl. 192-84.00T.

Wajaroff, Theodor; and Konrad, Eugen, to Wella AG. Reducing the alkali concentration in hair treating compositions. 3,975,515, Cl. 424-72.000.
Walbro Corporation: *See—*
Tuckey, Charles H., 3,975,468.
Walden, John, to FMC Corporation. Sodium carbonate monohydrate crystallization. 3,975,499, Cl. 423-266.000.
Wales, Michael: *See—*
Davison, Sol; and Wales, Michael, 3,975,460.
Walker, Frank J. Racket construction. 3,975,018, Cl. 273-73.00R.
Walker, Richard A., to Standard Pressed Steel Co. Tightening system and method. 3,974,685, Cl. 73-88.00F.
Walker, Ronald J., to Firestone Tire & Rubber Company, The. Continuous loop slip tongue. 3,974,546, Cl. 24-196.000.
Walker, Wilmer David, Jr. Figure with movable limbs, and base for mounting same. 3,974,593, Cl. 46-22.000.
Wallick, Seymour Dudley; Sandler, Joseph J.; Sandler, Marc L.; and Zabroski, Frank, to Lawn King, Inc. Lawn-treating apparatus. 3,974,967, Cl. 239-656.000.
Walt Disney Productions: *See—*
Black, Millard G.; Sheldon, Warren D.; and Cook, Dennis S., 3,974,778.
Walters, Ben. Method of making ornamental plastic articles. 3,975,480, Cl. 264-113.000.
Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing an N-(furyl- or thienyl-methyl)-desoxynormorphine or norcodeine and method of use. 3,975,368, Cl. 424-260.000.
Ward, Andrew H.: *See—*
Falender, James R.; Lindsey, Sarah E.; Ward, Andrew H.; and Kendrick, Thomas C., 3,975,455.
Ward, Harry M., III: *See—*
Hackbarth, Eugene R.; and Ward, Harry M., III, 3,975,122.
Wardell, George: *See—*
Stevenson, Neil Arthur; and Wardell, George, 3,975,536.
Warnock, Don R., to United States of America, Air Force. Metal-gas battery with axial reactant gas storage cavity. 3,975,210, Cl. 136-86.00A.
Wassen, Willem J., to Stamicarbon B.V. Process for carrying out nitrosation reactions and diazotation reactions. 3,975,425, Cl. 260-466.000.
Wasserbaech, Eberhard E.: *See—*
Akeel, A. Hadi K.; Gmurowski, Romuald; and Wasserbaech, Eberhard E., 3,975,030.
Watanabe, Shiro; Maruo, Keiichi; and Ono, Hiroshi, to Daikin Kogyo Co., Ltd. Herbicidal composition. 3,975,181, Cl. 71-113.000.
Watanabe, Takeshi: *See—*
Kondo, Tetsuya; and Watanabe, Takeshi, 3,974,805.
Watanabe, Teruji; and Ishihara, Hideo, to Kokusai Denshin Denwa Kabushiki Kaisha. Character pattern recognition method and apparatus using feature enhanced magnetic domain patterns. 3,975,710, Cl. 340-146.30C.
Watkins, Sidney C., to Avco Corporation. Miniature flat spray nozzle. 3,974,966, Cl. 239-590.300.
Watkins, Windell C., to Eastman Kodak Company. Dehydrogenation catalyst consisting of the calcined residue of ferric phosphate and lead phosphate. 3,975,301, Cl. 252-437.000.
Watts, George T., to Goodyear Tire & Rubber Company, The. Tire with unequal bead diameters. 3,974,870, Cl. 152-352.00R.
Waxmanski, Andrew. Shoe rack stack. 3,974,917, Cl. 211-36.000.
Weatherhead Company, The: *See—*
Orzel, Edward S., 3,975,059.
Webb, Anthony M., to Tesco Engineering Company. Check valve having self energizing seal. 3,974,855, Cl. 137-527.400.
Webb, Gene H. Technique and apparatus for balancing rotating members. 3,974,700, Cl. 73-468.000.
Webb, Larry J., to Honeywell Information Systems, Inc. Non-contact coupling plate for circuit board tester. 3,975,680, Cl. 324-61.00P.
Webb, Tommy W.: *See—*
Van Doorn, Donald W.; Colquett, Jack L.; Hawkins, James B.; Pease, William C., III; and Webb, Tommy W., 3,974,763.
Weber, Gerald; and Sorgenfrei, Jurgen, to Olympia Werke AG. Data processing system including an LSI chip containing a memory and its own address register. 3,975,714, Cl. 340-172.500.
Weber, Rudolf: *See—*
Hachmann, Klaus; Jakobi, Gunther; Weber, Rudolf; Boeck, Alexander; and Jung, Dieter, 3,975,280.
Wechter, William J.: *See—*
Gish, Duane T.; Gray, Gary D.; and Wechter, William J., 3,975,367.
Wehr Corporation: *See—*
Bokalders, Janis A.; and Jurich, Rade, 3,974,919.
Weigant, Franz: *See—*
Wolf, Albin; and Weigant, Franz, 3,974,595.
Weigl, Erwin; Rossler, Ernst; and Svoboda, Josef, to Gertsch AG. Safety ski binding. 3,975,034, Cl. 280-618.000.
Weigl, Erwin: *See—*
Lill, Viktor; Rossler, Ernst; Svoboda, Josef; and Weigl, Erwin, 3,975,033.
Weinberger, Arnold, to International Business Machines Corporation. Logic array with multiple readout tables. 3,975,623, Cl. 235-152.000.
Weinert, Fritz K.; Weinschel, Bruno O.; and Woodruff, Donald, to Weinschel Engineering Co., Inc. Direct-reading swept-frequency slotted line system with slope correction. 3,975,679, Cl. 324-58.50B.
Weinschel, Bruno O.: *See—*
Weinert, Fritz K.; Weinschel, Bruno O.; and Woodruff, Donald, 3,975,679.
Weinschel Engineering Co., Inc.: *See—*
Weinert, Fritz K.; Weinschel, Bruno O.; and Woodruff, Donald, 3,975,679.
Weinshenker, Ned M., to Dynapol. Polymeric organotin hydride reagents. 3,975,334, Cl. 526-19.000.
Weinz, Hans-Werner: *See—*
Munir, Mohammad; Schiweck, Hubert; Weinz, Hans-Werner; and Wurm, Fritz, 3,975,205.
Weisman, Harry Daniel. Combined comb and hair roller support. 3,974,841, Cl. 132-40.000.
Weisz, Geraldine Fay. Fluoride mouth wash compositions. 3,975,514, Cl. 424-52.000.
Weizenbach, Bauke: *See—*
Van Der Meulen, Sjaak Johan; Weizenbach, Bauke; Mackiw, Vladimir N.; and Kinjerski, Theodore Andrew, 3,975,190.
Wella AG: *See—*
Wajaroff, Theodor; and Konrad, Eugen, 3,975,515.
Weller, Frank M., Jr.: *See—*
Jacques, James O.; Kockler, Barry C.; and Weller, Frank M., Jr., 3,975,768.
Wells, John H.: *See—*
Bohl, Thomas L.; Goodnight, Lyman E., Jr.; Ruble, Herschel C.; and Wells, John H., 3,975,160.
Welstead, William John, Jr.; and Moran, Henry Wayne, to A. H. Robins Company, Incorporated. 4-(5- And 7-)benzoylindolin-2-ones and pharmaceutical uses thereof. 3,975,531, Cl. 424-274.000.
Wende, Charles W. J., to United States of America, Energy Research and Development Administration. Neutronic reactor. 3,975,233, Cl. 176-86.00R.
Wendel, Henry H., to Wendel, Henry H. Liquid treating system. 3,975,267, Cl. 210-35.000.
Wenger Corporation: *See—*
Wenger, Jerry A.; Urch, Harvey M.; and Boeddeker, David R., 3,974,894.
Wenger, Jerry A.; Urch, Harvey M.; and Boeddeker, David R., to Wenger Corporation. Portable riser. 3,974,894, Cl. 182-113.000.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Bory, Michael; and Grendelmeier, Georg, 3,975,667.
Werner, Joseph A.: *See—*
Schaffner, Joseph G.; Werner, Joseph A.; and Klein, Jacob, 3,974,774.
Werner, Mark: *See—*
Claunch, Robert W.; Deane, Thomas N.; Rogan, Patrick D. M.; Powe, Carl M.; and Werner, Mark, 3,974,528.
Werner, Wolfgang; Vogel, Peter; Tiedemann, Hugo; and Guthlein, Werner, to Boehringer Mannheim G.m.b.H. 9-Substituted 3-aminocarbazole compounds. 3,975,398, Cl. 260-315.000.
West, Michael Anthony, to Applied Photophysics Limited. Spectrofluorimeter. 3,975,098, Cl. 356-85.000.
Western Industries (Proprietary) Ltd.: *See—*
Moorey, Ernest J., 3,975,663.
Westinghouse Air Brake Company: *See—*
Delvernoise, Philip J., Jr., 3,974,776.
Noble, Peter M.; and Delvernois, Philip J., Jr., 3,974,963.
Toth, Charles V., 3,975,643.
Westinghouse Electric Corporation: *See—*
Akers, Ronald R., 3,975,184.
Albert, Willard S.; and Colaiaco, August P., 3,975,603.
Elco, Richard A.; Bauer, James A.; and Treese, Willard E., 3,975,254.
Emtage, Peter R.; Nalepa, Philip J.; and Miller, Robert C., 3,975,658.
Green, David; Nathanson, Harvey C.; and Malmberg, Paul R., 3,975,598.
Hardies, Charles E., 3,974,693.
Harvey, Francis J., II; and Fey, Maurice G., 3,975,188.
Hendry, Allen J.; and Maier, Alfred E., 3,975,701.
Kalkbrenner, Ralph W., 3,975,114.
Kilgore, Lee A.; Godwin, Gurney L.; and Whitney, Eugene C., 3,975,646.
Martz, Lyle F.; and Plotnick, Richard J., 3,974,644.
Matty, Thomas C., 3,974,992.
McLaughlin, Emmett J., 3,975,073.
Mego, Alexander, Jr.; and Feichtner, John D., 3,975,692.
Melamed, Nathan T.; and Steinbruegge, Kenneth B., 3,975,694.
Newton, John W.; and Helt, Wilson G., 3,975,656.
Reinshagen, H. Alan; and Edelman, Leonard E., 3,975,322.
Schlegel, Earl S., 3,975,758.
Shirland, Fred A., 3,975,211.
Smith, Jack R.; and Reed, Terry J., 3,974,643.
Smith, Jack R., 3,974,645.
Westvaco Corporation: *See—*
Eckert, Robert C., 3,975,232.
Wheatley, Thomas. Three pot two way check valve. 3,974,848, Cl. 137-102.000.
Whelan, Robert D., to General Instrument Corporation. Rotary switch actuatable to generate pulses in a selected one of two nodes. 3,975,601, Cl. 200-11.00R.
White, David R., to Upjohn Company, The. Preparing carboxylic acids from glycidonitriles through enol acylates. 3,975,431, Cl. 260-515.00R.
Whiteside, George D.: *See—*
Johnson, Bruce K.; and Whiteside, George D., 3,975,744.

Whitney, Eugene C.: *See—*
Kilgore, Lee A.; Godwin, Gurney L.; and Whitney, Eugene C., 3,975,646.

Whitworth, Samuel, to Boeing Company, The. Three-wheel landing gear assembly. 3,974,988, Cl. 244-103.00R.

Wick, Alexander Eduard: *See—*
Mayer, Hans Johann; Fischli, Albert Eduard; Klaus, Michael Josef; and Wick, Alexander Eduard, 3,975,406.

Wick, Arnold; and Jost, Max, to Ciba-Geigy Corporation. Process for the manufacture of halogen-containing anthraquinoidal compounds, their use and new halogen-containing anthraquinoidal compounds. 3,975,410, Cl. 260-376.000.

Wickersham, Woodrow Christman: *See—*
Asmus, Carl Junior; and Wickersham, Woodrow Christman, 3,974,687.

Wicki, Heinz, to Sandoz Ltd. 2:1 Metal complexes of 2,2',4'-trihydroxy-3,5-dinitroazobenzene bound to a diphenylamine through an azo bridge. 3,975,369, Cl. 260-145.00B.

Widehn, Ake: *See—*
Bielsten, Nils-Ove; Dahle, Orvar; Grek, Ronald; Lindback, Lars-Erik; Siby, Sture; and Widehn, Ake, 3,975,685.

Wideman, Lawson G., to Goodyear Tire & Rubber Company, The. Preparation of 3-methylpiperidine. 3,975,392, Cl. 260-293.520.

Wiewiorowski, Tadeusz K.; and Miller, David J., to Freeport Minerals Company. Enhanced selectivity in the separation of nickel and cobalt from ammoniacal solutions. 3,975,497, Cl. 423-140.000.

Wilante, Claude: *See—*
Delaunois, Yvon; and Wilante, Claude, 3,975,448.

Wild, Albrecht: *See—*
Gante, Joachim; Mehrhof, Werner; and Wild, Albrecht, 3,975,403.

Wild, Jost: *See—*
Helminger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,975,311.

Wilde, Gerd: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

Wildforster, Heinrich: *See—*
Henkel, Egon; and Wildforster, Heinrich, 3,974,716.

Wilhoit, Eugene D.: *See—*
Mahler, Eddie G.; McAllister, Patrick R.; and Wilhoit, Eugene D., 3,975,502.

Wilke, David J.: *See—*
Kaufman, Alan D.; Reistad, Arne M., Jr.; and Wilke, David J., 3,974,712.

Willem, Arnold August: *See—*
Van Engeland, Jozef Leonard; and Willem, Arnold August, 3,975,626.

William Prym-Werke KG: *See—*
Pickert, Hansjurgen; and Sesselmann, Dieter, 3,974,785.

Williams, Joseph A.: *See—*
Fisher, Lewis M.; and Williams, Joseph A., 3,975,115.

Willis, Chester R.: *See—*
Snader, Kenneth M.; and Willis, Chester R., 3,975,380.

Wilson, Michael R., to Canadian Patents and Development Limited. Enteric disease vaccine. 3,975,517, Cl. 424-87.000.

Wilston, Arthur Lloyd. Paste dispensing device. 3,974,943, Cl. 222-103.000.

Winkler, Adalbert: *See—*
Holl, Ludwig; Winkler, Adalbert; and Grunewald, Eberhard L., 3,975,665.

Winrow, Donald, to Ferranti-Packard Limited. Electromagnetic displays with resiliently mounted components. 3,975,728, Cl. 340-373.000.

Winzeler Stamping Co.: *See—*
Ruckriegel, Alfred E., 3,974,782.

Winzer, Gerhard, to Siemens Aktiengesellschaft. Laser beam coupling arrangement. 3,975,082, Cl. 350-96.00C.

Wireman, Jack; and Kazares, Richard Elliott, to AMF Incorporated. Method and apparatus for forming material having a predefined cross-section. 3,975,126, Cl. 425-141.000.

Wirtgen, Reinhard. Apparatus for milling road surfaces. 3,975,055, Cl. 299-39.000.

Wismer, Marco: *See—*
Bosso, Joseph F.; and Wismer, Marco, 3,975,346.

Wittenburg, Otto: *See—*
Madebach, Karl-Heinz; Wittenburg, Otto; Wilde, Gerd; Taube, Werner; Lauterberg, Werner; Barthel, Dieter; Pape, Dieter; Gerstner, Gerhard; and Antemann, Joachim, 3,975,562.

Wittkamp, Theodor, to Gildemeister Aktiengesellschaft. Mechanism for moving slides in machine tools. 3,974,705, Cl. 74-53.000.

Wochnowski, Waldemar; Leckband, Uwe; Barth, Hans-Heinrich; and Hohm, Reinhard, to Hauni-Werke Korber & Co., KG. Conditioning of tobacco. 3,974,839, Cl. 131-136.000.

Wohrer, Luis C.: *See—*
Cottis, Steve G.; Economy, James; and Wohrer, Luis C., 3,975,487.

Wolf, Albin; and Weigant, Franz, to Fa. Zahnraderfabrik Renk AG. Gear grinding machine for spiral bevel gears. 3,974,595, Cl. 51-5.00D.

Wolfe, Louis H.: *See—*
Radd, Frederick J.; Wolfe, Louis H.; and Oertle, Donald H., 3,975,253.

Wolfe, Robert W.: *See—*
Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., 3,974,922.

Wolff & Kaaber: *See—*
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,975,318.
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John Arthur Gooch, 3,975,319.

Wolter, Heinz, to Josef Voss KG. Turnover key and corresponding cylinder lock. 3,974,670, Cl. 70-364.00A.

Wood, Alexander M.: *See—*
Penneck, Richard J.; and Wood, Alexander M., 3,975,039.

Wood, Lee A., to Crown Cork & Seal Company, Inc. Spray coating apparatus. 3,974,998, Cl. 251-76.000.

Woodings, Bruce Edward: *See—*
Allen, Marvin Martin; Miller, John Alois; and Woodings, Bruce Edward, 3,975,219.

Woodruff, Donald: *See—*
Weinert, Fritz K.; Weinschel, Bruno O.; and Woodruff, Donald, 3,975,679.

Worden, John A.: *See—*
Bergmann, Werner J.; and Worden, John A., 3,974,955.

Worf, Guenther: *See—*
Ruzek, Ivo; Worf, Guenther; Hartmann, Ludwig; Maahs, Paul; and Gerking, Lueder, 3,975,224.

Wright, John F.: *See—*
Yoerger, William E.; McCabe, John M.; and Wright, John F., 3,975,352.

Wuchner, Xaver, to Georg Fischer Aktiengesellschaft. Pipe cutting device. 3,974,562, Cl. 30-97.000.

Wulff, Gunther; and Vogt, Josef, to Balzers Patent und Beteiligungs AG. Electron beam-generating system. 3,975,613, Cl. 219-121.0EB.

Wurm, Fritz: *See—*
Munir, Mohammad; Schiweck, Hubert; Weinz, Hans-Werner; and Wurm, Fritz, 3,975,205.

Wygant, James C., to Monsanto Company. Tractants comprising linear dimers of α-alkyl styrene. 3,975,278, Cl. 252-59.000.

Wyman, James H.: *See—*
Peyton, John J.; and Wyman, James H., 3,975,260.

Wysong, Don V.: *See—*
McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., 3,975,433.

Xerox Corporation: *See—*
Angelini, Dominic J.; and Perry, Philip G., 3,975,681.
Davie, Walter C., 3,975,668.
Fantuzzo, Joseph, 3,974,554.
Froix, Michael F., 3,975,289.
Goffe, William L., 3,975,195.
Goffe, William L., 3,975,739.
Hutner, Mark A., 3,975,715.
Johnson, Wendell C., 3,974,905.
Jones, Robert N.; and Swarthout, David J., 3,975,306.
Lee, Sen Lin; and Hess, Ernst Peter, 3,974,906.
Lennon, John H., 3,975,635.
Murray, Gerald J., Jr.; and Klingenberg, Gordon U., 3,974,796.
Thornburg, David D., 3,975,755.

Yajima, Kenichi, to Diesel Kiki Kabushiki Kaisha. Fuel injection pump. 3,974,810, Cl. 123-139.00R.

Yakubowski, Carl: *See—*
Janson, Norma M.; and Yakubowski, Carl, 3,974,709.

Yamada, Muneki: *See—*
Hirata, Sadao; Yamada, Muneki; and Kishimoto, Akira, 3,975,463.

Yamada, Tatsuya; Kawashima, Toshihide; and Oozeki, Takashi, to Tokyo Shibaura Electric Co., Ltd. Liquid crystal display device with interdigital electrodes. 3,975,085, Cl. 350-160.0LC.

Yamaguchi, Katsuhiko: *See—*
Suzuki, Yasuhiro; and Yamaguchi, Katsuhiko, 3,975,330.

Yamaguchi, Toshiaki: *See—*
Mukai, Hideo; Yamaguchi, Toshiaki; and Yoshida, Tsuneo, 3,974,976.

Yamamoto, Akira: *See—*
Kitagaki, Tetsuro; Yamamoto, Akira; and Ishihara, Toshinobu, 3,975,446.

Yamanaka, Seisuke; Kanou, Yasuo; Mifune, Tadayoshi; and Shimada, Satoshi, to Sony Corporation. Solid state camera. 3,975,760, Cl. 358-41.000.

Yamanaka, Yoshiyuki: *See—*
Ichikawa, Yataro; Yamanaka, Yoshiyuki; Suzuki, Nobuo; and Tsuruta, Hideki, 3,975,441.

Yamashita, Hiroshi; and Sakasai, Yutaka, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 3,975,199, Cl. 96-100.000.

Yamashita, Tadaoki: *See—*
Ikedo, Masaru; Yasuno, Yoshitake; and Yamashita, Tadaoki, 3,975,637.

Yamashita, Takamasa: *See—*
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.

Yamawaki, Takeshi; Hayashi, Masahiro; and Endo, Kazuo, to Mitsubishi Chemical Industries Ltd. Process for preparing a graft copolymer. 3,975,461, Cl. 260-879.000.

Yang, Kang; and Reedy, James D., to Continental Oil Company. Steam distillation of polyvinyl chlorine slurry in presence of metal salt. 3,975,230, Cl. 159-47.00R.

Yankee, Ernest W., to Upjohn Company, The. 8β, 11β, 12a-PGF_2 compounds. 3,975,426, Cl. 260-468.00D.
Yardley, John P.: *See*—
Fletcher, Horace; Malis, Jerry I.; and Yardley, John P., 3,975,436.
Yaremchuk, George. Magnetic book supporting structure. 3,974,918, Cl. 211-43.000.
Yasunaga Riken Co., Ltd.: *See*—
Yasunaga, Yoshikazu; Hokao, Zenjiro; Sakusabe, Koji; and Tago, Yoshimitsu, 3,975,228.
Yasunaga, Yoshikazu; Hokao, Zenjiro; Sakusabe, Koji; and Tago, Yoshimitsu, to Yasunaga Riken Co., Ltd. Drying method and plant which utilize flame jet. 3,975,228, Cl. 159-16.00A.
Yasuno, Yoshitake: *See*—
Ikedo, Masaru; Yasuno, Yoshitake; and Yamashita, Tadaoki, 3,975,637.
Yato, Yoshiaki: *See*—
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.
Yaverbaum, Sidney: *See*—
Vann, William P.; and Yaverbaum, Sidney, 3,975,511.
Yelton, Emerson McBrayer; and Reid, James Paul, Jr., to Burlington Industries, Inc. Process for vacuum treatment of textile materials. 3,974,534, Cl. 8-155.100.
Yoerger, William E.; McCabe, John M.; and Wright, John F., to Eastman Kodak Company. Repellent compositions and elements containing the same. 3,975,352, Cl. 260-33.80F.
Yokouchi, Michinori: *See*—
Maeda, Takamasa; Kamata, Yasuhiko; Shimaya, Shyozo; Tatsuta, Taiji; Yamashita, Takamasa; Kawakami, Hiromi; Matsuki, Takeshi; Yato, Yoshiaki; Yokouchi, Michinori; and Kijima, Takeshi, 3,975,730.
Yokozato, Junichi: *See*—
Yoshino, Zenzaburo; Ando, Yoshikazu; and Yokozato, Junichi, 3,975,750.
Yonezawa, Tatsuo: *See*—
Nakazaki, Takamitsu; Kita, Hisanao; Yonezawa, Tatsuo; Kawada, Yasuzi; and Okamura, Hisanori, 3,975,612.
York, Leonard R., to Lafayette Engineering & Manufacturing, Inc. Particulate solids pump. 3,975,058, Cl. 302-50.000.
Yorozu, Makoto: *See*—
Sugimatsu, Akihito; Yorozu, Makoto; Nomura, Tadayoshi; Yoshino, Isamu; and Yoshikawa, Hachiro, 3,975,569.
Yoshida Kogyo Kabushiki Kaisha: *See*—
Fujisaki, Yoshinori; Matsuda, Yoshio; and Tsubokawa, Yoshitoki, 3,974,550.
Matsuda, Yoshio, 3,974,549.
Sado, Yukio, 3,975,000.
Yoshida, Tsuneo: *See*—
Mukai, Hideo; Yamaguchi, Toshiaki; and Yoshida, Tsuneo, 3,974,976.
Yoshikawa, Hachiro: *See*—
Sugimatsu, Akihito; Yorozu, Makoto; Nomura, Tadayoshi; Yoshino, Isamu; and Yoshikawa, Hachiro, 3,975,569.
Yoshimoto, Hiroshi: *See*—
Suzui, Akio; Yoshimoto, Hiroshi; and Kuri, Takeshi, 3,975,349.
Yoshino, Isamu: *See*—
Sugimatsu, Akihito; Yorozu, Makoto; Nomura, Tadayoshi; Yoshino, Isamu; and Yoshikawa, Hachiro, 3,975,569.
Yoshino, Zenzaburo; Ando, Yoshikazu; and Yokozato, Junichi, to Zenza Bronica Industries, Inc. View finder for a single lens reflex camera. 3,975,750, Cl. 354-225.000.
Yoshioka, Takao: *See*—
Murayama, Keisuke; Morimura, Syoji; and Yoshioka, Takao, 3,975,357.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,975,462.
Yoshizaki, Shiro: *See*—
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tanimura, Kaoru; and Tamada, Shigeharu, 3,975,391.
Young, David Anthony: *See*—
Richardson, Frank Peter; and Young, David Anthony, 3,975,508.
Young, Douglas Charles: *See*—
Beatty, Gordon Wesley; and Young, Douglas Charles, 3,974,605.
Young, Murray Moo, to University of Waterloo, The. Fermentation processes for making penicillin and cellulase. 3,975,236, Cl. 195-36.00P.
Youngdale, Gilbert A.: *See*—
Lincoln, Frank H., Jr.; Pike, John E.; and Youngdale, Gilbert A., 3,975,404.
Zabkov, Fedor Efimovich: *See*—
Gitin, Yakov Aronovich; Bondarev, Konstantin Timofeevich; Leschinsky, Yakov Borisovich; Zabkov, Fedor Efimovich; Parfimovich, Vasily Gavrilovich; Ruga, Asty Sevastyanovich, deceased; and Ruga, Viktor Astievich, administrator, 3,975,130.
Zabroski, Frank: *See*—
Wallick, Seymour Dudley; Sandler, Joseph J.; Sandler, Marc L.; and Zabroski, Frank, 3,974,967.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,975,366.
Zanoni, Carl A.: *See*—
Rosenfeld, Alvin H.; and Zanoni, Carl A., 3,975,102.
Zarnecki, W. E.: *See*—
Phillips, K. G.; and Zarnecki, W. E., 3,975,347.
Zazula, Teodosij: *See*—
Kulka, Kurt; and Zazula, Teodosij, 3,975,309.
Zdarsky, Josef; Rehor, Jan; and Bretschneider, Rudolf, to Vysoka skola chemicko-technologicka. Method of post-harvest treatment of sugar cane. 3,975,204, Cl. 127-42.000.
Zechlin, Richard: *See*—
Henderson, Robert M.; Zechlin, Richard; and Reddy, K. Narasimha, 3,974,816.
Henderson, Robert M.; and Zechlin, Richard, 3,974,817.
Zeitler, Walter: *See*—
Voise, Siegfried; Wagner, Thomas M.; and Zeitler, Walter, 3,975,597.
Zellhoefer, Glenn F., to National Union Electric Corporation. Thermal cell with an anode comprising a magnesium alloy with a refractory oxide. 3,975,209, Cl. 136-83.00T.
Zenith Radio Corporation: *See*—
Palac, Kazimir; and Stachniak, Raymond M., 3,975,198.
Zenza Bronica Industries, Inc.: *See*—
Yoshino, Zenzaburo; Ando, Yoshikazu; and Yokozato, Junichi, 3,975,750.
Ziegenhain, William C.; Leach, Bruce E.; and Coleman, Dean O., to Continental Oil Company. Method for producing concentrated alumina slurries. 3,975,231, Cl. 159-47.00R.
Zimmer, Curtis E.: *See*—
Myles, Thomas A.; and Zimmer, Curtis E., 3,975,308.
Zimmer, Peter. Process for imprinting spaced-apart web sections with a composite pattern. 3,974,766, Cl. 101-129.000.
Zimmerman, Arnold: *See*—
Ullmann, Werner; Schumacher, Bernd; Farinelli, Robert; Zimmerman, Arnold; Fricker, Paul; and Durin, Michel, 3,975,608.
Zirconal Processes Limited: *See*—
Emblem, Harold Garton; and McPherson, John Andrew, 3,975,202.
Zoecon Corporation: *See*—
Henrick, Clive A.; and Staal, Gerardus B., 3,975,429.
Zorn, Karl-Ludwig, to Robert Bosch G.m.b.H. Method of guiding a light beam on an optical signal track. 3,975,630, Cl. 250-202.000.
Zygo Corporation: *See*—
Rosenfeld, Alvin H.; and Zanoni, Carl A., 3,975,102.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF AUGUST, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Boehringer Ingelheim GmbH: *See*—
Weber, Karl-Heinz; Zeile, Karl; Danneberg, Peter; Hauptmann, Karl Heinz, deceased; and Hauptmann, Maria, heiress, Re. 28,935.

Brown, Alvin E., to Du Pont de Nemours, E. I., and Company. Ultrasonic fluid speed of sound and flow meter apparatus and method. Re. 28,929, Cl. 73-194.00A.

Bryan, Graham W.: *See*—
Noiles, Douglas G.; and Bryan, Graham W., Re. 28,932.

Danneberg, Peter: *See*—
Weber, Karl-Heinz; Zeile, Karl; Danneberg, Peter; Hauptmann, Karl Heinz, deceased; and Hauptmann, Maria, heiress, Re. 28,935.

Du Pont de Nemours, E. I., and Company: *See*—
Brown, Alvin E., Re. 28,929.

Eastman Kodak Company: *See*—
Masseth, Thomas J., Re. 28,934.

Gresen Manufacturing Company: *See*—
Huber, Mortimer J., Re. 28,933.

Hauni-Werke Korber & Co., KG: *See*—
Lehmann, Frank-Dieter, Re. 28,931.

Hauptmann, Karl Heinz, deceased: *See*—
Weber, Karl-Heinz; Zeile, Karl; Danneberg, Peter; Hauptmann, Karl Heinz, deceased; and Hauptmann, Maria, heiress, Re. 28,935.

Hauptmann, Maria, heiress: *See*—
Weber, Karl-Heinz; Zeile, Karl; Danneberg, Peter; Hauptmann, Karl Heinz, deceased; and Hauptmann, Maria, heiress, Re. 28,935.

Huber, Mortimer J., to Gresen Manufacturing Company. Hydraulic torque motor. Re. 28,933, Cl. 418-61.00B.

Johnson, Lowell, to Transco Inc. Removable insulated pipe jacket. Re. 28,930, Cl. 138-158.000.

Lehmann, Frank-Dieter, to Hauni-Werke Korber & Co., KG. Method and apparatus for separating selected cigarettes or analogous rod-shaped articles from a series of rapidly moving equidistant articles. Re. 28,931, Cl. 209-74.00M.

Masseth, Thomas J., to Eastman Kodak Company. Photographic developer composition containing formaldehyde bisulfite alkanolamine condensation product and free alkanolamine. Re. 28,934, Cl. 96-66.400.

Noiles, Douglas G.; and Bryan, Graham W., to United States Surgical Corporation. Surgical stapling instrument. Re. 28,932, Cl. 227-19.000.

Transco Inc.: *See*—
Johnson, Lowell, Re. 28,930.

United States Surgical Corporation: *See*—
Noiles, Douglas G.; and Bryan, Graham W., Re. 28,932.

Weber, Karl-Heinz; Zeile, Karl; Danneberg, Peter; Hauptmann, Karl Heinz, deceased; and by Hauptmann, Maria, heiress, to Boehringer Ingelheim GmbH. 5-Phenyl-7-chloro-1H-1,5-benzodiazepine-2,4-(3H,5H)-diones. Re. 28,935, Cl. 260-239.30B.

Zeile, Karl: *See*—
Weber, Karl-Heinz; Zeile, Karl; Danneberg, Peter; Hauptmann, Karl Heinz, deceased; and Hauptmann, Maria, heiress, Re. 28,935.

LIST OF PLANT PATENTEES

Moore, Ralph S. Miniature house plant. 3,940, 8–17–76, Cl. 9.

LIST OF DESIGN PATENTEES

AB Husqvarna Borstfabrik: *See*—
Gestranius, Lars, and Knorring. 240,988.

AB Volvo: *See*—
Sandberg, Ulf A. 241,069.

Adair, Edwin L. Combined bottle and carrying handle. 241,010, 8–17–76, Cl. D9—10.

Adams, Thomas M. Dual lace boot. 240,972, 8–17–76, Cl. D2—275.

Airco, Inc.: *See*—
Barta, Raymond D. 240,970.

American Home Products, Inc.: *See*—
Brady, Joseph E., and Curtis. 241,009.

Amerock Corp.: *See*—
Tegner, Raymond U. H. 241,002.

Anchor Hocking Corp.: *See*—
Benes, Frank J. 240,991.

Antunes, August J.: *See*—
Miller, Dye O., Antunes, A. J., J. 240,994.

Antunes, Jerome: *See*—
Antunes, A., Miller, and Antunes. 240,994.

Asano Bolts Nuts Co., Ltd.: *See*—
Asano, Tosiji. 241,005.

Asano, Tosiji, to Asano Bolts Nuts Co., Ltd. Turnbuckle body. 240,005, 8–17–76, Cl. D8—229.

Bacarella, Michael, Jr. Dragon's head. 241,043, 8–17–76, Cl. D34—2.

Bacino, Elgel J., and G. K. Porter, to Porter Instrument Co., Inc. Flow meter. 241,021, 8–17–76, Cl. D10—96.

Baker, Charles T., to Vermont Marble Co. Can or the like. 241,017, 8–17–76, Cl. D9—216.

Barnhart, Charles C., and C. W. Cassidy, to Standard Container Co. Sandwich container. 241,014, 8–17–76, Cl. D9—180.

Barta, Raymond D., to Airco, Inc. Welder's mask. 240,970, 8–17–76, Cl. D2—232.

Benes, Frank J., to Anchor Hocking Corp. Cup or similar article. 240,991, 8–17–76, Cl. D7—9.

Berkey Photo Inc.: *See*—
Kupiec, John M., and Goldberg. 240,042.

Berkline Corp., The: *See*—
Long, Stapleton. 240,984.

Bernstein, Bruce, to Handiform Plastic Corp. Hanger. 240,990, 8–17–76, Cl. D6—248.

Bliss & Laughlin Industries, Inc.: *See*—
Pinaire, Lon W., Godwin, and Freeman. 241,004.

Bode, Robert G. Splash guard. 241,029, 8–17–76, Cl. D12—185.

Bohlmann, Orville R. Animal waterer. 241,041, 8–17–76, Cl. D30—13.

Boucher, Richard A., to Dart Industries, Inc. Food molding ring. 240,992, 8–17–76, Cl. D7—43.

Bourassa, Joseph R., and M. Lopez, to Parker-Hannifin Corp. Vehicle door mirror mounting bracket. 241,030, 8–17–76, Cl. D12—187.

Brady, Joseph E., and H. E. Curtis, to American Home Products, Inc. Dispensing container. 241,009, 8–17–76, Cl. D9—2.

Brother International Corp.: *See*—
Davis, Falkon S. 241,070.

Brown, Donald L. Solitaire game board. 241,052, 8–17–76, Cl. D34—13.

Brown, Gene T., and W. B. Thompson. Housing for a vehicular radio communication system. 241,036, 8–17–76, Cl. 026—14.

Burke, Frederick A., and D. A. Long, to The Gillette Co. Watering pail. 241,032, 8–17–76, Cl. D23—11.

Burke, Frederick A., J. A. Farrell, and D. A. Long, to The Gillette Co. Flower pot. 241,058, 8–17–76, Cl. D35—3.

Cassidy, Carol W.: *See*—
Barnhart, Charles C., and Cassidy. 241,014.

Chadco, Inc.: *See*—
Chadwick, Orlando A. 241,019.

Chadwick, Orlando A., to Chadco, Inc. Drapery pleater gauge. 241,019, 8–17–76, Cl. D10—62.

Congleton, Wayne L., to Bolco Packaging Co. Compartmented packaging container. 241,015, 8–17–76, Cl. D9—184.

Corrigan, Gordon D.: *See*—
Green, Raymond J., and Corrigan. 241,077.

Cowan, Murray L., to Textron, Inc. Expansible link chain for a bracelet or similar article. 241,061, 8–17–76, Cl. D45—41.

Cox, William F. Camper trailer. 241,027, 8–17–76, Cl. D12—104.

Crystal Mart, Inc.: *See*—
Schacht, Arthur. 241,066.

Curtis, Howard E.: *See*—
Brady, Joseph E., and Curtis. 241,009.

Daenen, Robert H. C. M., to Dart Industries Inc. Figurine toy or the like. 241,044, 8–17–76, Cl. D34—4.

Damsky, Gerald W., L. Feldman, and J. E. Rohr, to Ev. Game, Inc. Display unit. 240,985, 8–17–76, Cl. D6—85.

Dart Industries, Inc.: *See*—
Boucher, Richard A. 240,992.
Daenen, Robert H. C. M. 241,044.

Davis, Falkon S., to Brother International Corp. Combined phonograph and cartridge player. 241,070, 8–17–76, Cl. D56—4.
De Amicis, Ferdnando. Closure plug set. 241,018, 8–17–76, Cl. D9—281.
Dekker, Evert J., to Indola Cosmetics B.V. Bottle or the like. 241,013, 8–17–76, Cl. D9—160.
Delco Packaging Co: *See*—
Congleton, Wayne L. 241,015.
De Luca, Paul V., to Porta Systems. Telephone plug or similar article. 241,034, 8–17–76, Cl. D26—1.
De Lucia, Philip A. Collapsible enclosure for lavatories or the like. 240,987, 8–17–76, Cl. D6—181.
De Muller, y de Abadal. Bottle. 241,012, 8–17–76, Cl. D9—151.
Di Loreto, Edward, to Yale Engineering Co. Threaded insert. 241,008, 8–17–76, Cl. D8—272.
Disbrow, Richard A. Bicycle reflector. 241,022, 8–17–76, Cl. D10—111.
Du Pont, E. I., de Nemours & Co.: *See*—
Hill, Percy H., and Kreifeldt. 240,981.
EDI Corp.: *See*—
Young, Carl. 241,059.
Eaton Corp.: *See*—
Meiser, Edward H. 241,003.
Eshelman, Cheston L. Wheel bumper. 241,028, 8–17–76, Cl. D12—160.
Ev. Game, Inc.: *See*—
Damsky, Gerald W., Feldman, and Rohr. 240,985.
Farrell, Joel A.: *See*—
Burke, Frederick A., Farrell, and Long. 241,058.
Feldman, Lawrence: *See*—
Damsky, Gerald W., Feldman, and Rohr. 240,985.
Felix, Cristian J.: *See*—
Genaro, Donald M., and Felix. 241,076.
Ferranti-Packard Ltd.: *See*—
Winrow, Donald. 241,081.
Fortier, Guy. Toy construction pieces. 241,054, 8–17–76, Cl. D34—15.
France, George E. Agriboilding air intake. 241,033, 8–17–76, Cl. D23—139.
Freeman, John M.: *See*—
Godwin, Pinaire, and Freeman. 241,004.
Fucci, Joseph M.: *See*—
Salvatore, Albert A., and Fucci. 240,998.
Fuji Latex Co. Ltd.: *See*—Komamura, and Ishihame. 241,078.
Genaro, Donald M., and C. J. Felix, to The Singer Co. Sewing machine frame or similar article. 241,076, 8–17–76, Cl. D70—1.
General Electric Co.: *See*—
Houlihan, John T. 241,067.
General Motors Corp.: *See*—
Green, Raymond J., and Corrigan. 241,077.
Gestranius, Lars, and P. V. Knorring, to AB Husqvarna Borstfabrik. Exterior casing component for furniture articles. 240,988, 8–17–76, Cl. D6—195.
Gillette Co., The: *See*—
Burke, Frederick A., Farrell, and Long. 241,058.
Burke, Frederick A., and Long. 241,032.
Glaberson, Martin, to Warner-Lambert Co. Razor handle as shown and described. 241,080, 8–17–76, Cl. D95—3.
Godwin, Robert H.: *See*—
Pinaire, Lon W., Godwin, and Freeman. 241,004.
Goldberg, Eugene: *See*—
Kupiec, John M., and Goldberg. 240,042.
Gonzalez, Boris, to Societe Anonym Automobiles Citroren. Automobile. 241,026, 8–17–76, Cl. D12—91.
Gray, William J., to Norcross Inc. Font of script. 241,075, 8–17–76, Cl. D64—17.
Green Bay Food Co.: *See*—
Pettengill, Floyd E. 241,011.
Green, Raymond J., and G. D. Corrigan, to General Motors Corp. Internal combustion rotary engine rotor housing. 241,077, 8–17–76, Cl. D77—1.
Gregory, John R. Glove with raised backing. 240,975, 8–17–76, Cl. D2—361.
Haas, Peter R., to Sindaco S.A. Switzerland. Timepiece dial cover. 241,023, 8–17–76, Cl. D10—132.
Hall, Andrew D. Combined bottle and cap opener. 240,999, 8–17–76, Cl. D8—38.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Ink roller. 241,074, 8–17–76, Cl. D64—11.
Hanlform Plastic Corp.: *See*—
Bernstein, Bruce. 240,989.
Bernstein, Bruce. 240,990.
Hartman, Robert G. Plant pot. 241,057, 8–17–76, Cl. D35—3.
Hemphill, James E. Portable expandable camping grill. 240,995, 8–17–76, Cl. D7—136.
Hendlin, Julian J. Combined game pieces and holder. 241,045, 8–17–76, Cl. D34—5.
Hibdon, William T. Loudspeaker cabinet, or similar article. 241,038, 8–17–76, Cl. D26—14.
Hill, Percy H., and J. G. Kreifeldt, to E. I. du Pont de Nemours & Co. Toothbrush. 240,981, 8–17–76, Cl. D4—25.
Houlihan, John T., to General Electric Co. Clock radio. 241,067, 8–17–76, Cl. D56—4.
Hubble, Fred R., to Tyme and Tydings Inc. Rotating message device. 241,082, 8–17–76, Cl. D96—12.
Hugo, Hans J., to U.S. Philips Corp. Steam and spray iron. 240,997, 8–17–76, Cl. D7—202.
Indola Cosmetics B.V.: *See*—
Dekker, Evert J. 241,013.
Ishihame, Atsum: *See*—
Komamura, Okamoto, and Komamura. 241,078.
Jacobson, Clayton J. Jet powered aquatic vehicle. 241,025, 8–17–76, Cl. D12—69.
Karlin, James H., to Motorola, Inc. Display module or similar article. 241,035, 8–17–76, Cl. D26—5.
Kawaski, Kazuo, to Nissan Denshi Kabushikigaisha. Combined transceiver and radio. 241,068, 8–17–76, Cl. D56—4.
Knok-N-Lok International, Inc.: *See*—
Solo, Alan J. 241,007.
Knorring, Peter V.: *See*—
Gestranius, Lars, and Knorring. 240,988.
Koch, Samuel J. Scale for computing calories of food. 241,020, 8–17–76, Cl. D10—91.
Komamura, Takeo: *See*—
Okamoto, Tadao, Komamura, and Ishihame. 241,078.
Kreifeldt, John G.: *See*—
Hill, Percy H., and Kreifeldt. 240,981.
Kupiec, John M., and E. Goldberg, to Berky Photo Inc. Color analyzer. 241,042, 8–17–76, Cl. D32—2.
Langston, Davey L. Flying toy. 241,056, 8–17–76, Cl. D34—15.
Lants, Larry M., and W. L. Mitchell. Appliance portable lifter. 241,024, 8–17–76, Cl. D12—56.
Leader, Victor. Lawn mower grass catcher chute. 241,060, 8–17–76, Cl. D40—1.
Levin, Monte L., to Scovill Mfg. Co. An electric food cooker. 240,993, 8–17–76, Cl. D7—94.
Long, Douglas A.: *See*—
Burke, Frederick A., Farrell, and Long. 241,058.
Burke, Frederick A., and Long. 241,032.
Long, Stapleton, to The Berkline Corp. Chair. 240,984, 8–17–76, Cl. D6—37.
Lopez, Manuel: *See*—
Bourassa, Joseph R., and Lopez. 241,030.
MEM Molded Products Co.: *See*—
Minneman, William J. 241,079.
Madl, Alfred W., to Oeter Corp. Housing for a meat grinder, salad shredder or the like. 240,996, 8–17–76, Cl. D7—153.
McMann, Renville H., Jr., C. W. Smith, and J. C. Wistrand, to Thomson-CSF Laboratories, Inc. Television camera. 241,072, 8–17–76, Cl. D26—14.
Meisner, Edward H., to Eaton Corp. Door closer body. 241,003, 8–17–76, Cl. D8—203.
Miller, Dye O., A. J. Antunes, and J. Antunes. Corn grill. 240,994, 8–17–76, Cl. D7—96.
Minneman, William J. to MTM Molder Products Co. Pocket cartridge case. 241,079, 8–17–76, Cl. D87—1.
Mitchell, William L.: *See*—
Lants, Larry M., and Mitchell. 241,024.
Miyazaki, Sadayasu. Toy bank. 241,049, 8–17–76, Cl. D34—11.
Miyazaki, Sadayasu. Toy bank. 241,050, 8–17–76, Cl. D34—11.
Miyazaki, Sadayasu. Toy bank. 241,051, 8–17–76, Cl. D34—11.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr. 241,074.
Monroy, Jacob G. Motion picture camera. 241,073, 8–17–76, Cl. D16—3.
Motorola, Inc.: *See*—
Karlin, James H. 241,035.
Nissan Danshi Kabashikigaisha: *See*—
Kawaski, Kazuo. 241,068.
Norcross Inc.: *See*—
Gray, William J. 241,075.
Okamoto, Tadao, T. Komamura, and A. Ishihame, to Fuji Latex Co. Ltd. Intra-uterine device for contraception. 241,078, 8–17–76, Cl. D83—12.
Oster Corp.: *See*—
Madl, Alfred W. 240,996.
Parker-Hannifin Corp.: *See*—
Bourassa, Joseph R., and Lopez. 241,030.
Pester, K. Clark, to Procter & Gamble Co. Sheet or paper toweling. 241,071, 8–17–76, Cl. D59—2.
Pettengill, Floyd E., to Green Bay Food Co. Jar or similar article. 241,011, 8–17–76, Cl. D9—141.
Pinaire, Lon W., R. H. Godwin, and J. M. Freeman, to Bliss & Laughlin Industries, Inc. Dual wheel caster. 241,004, 8–17–76, Cl D8—22.
Plaumann, Margarethe. Game board. 241,046, 8–17–76, Cl. D34—5.
Porta Systems: *See*—
De Luca, Paul V. 241,034.
Porter Instrument Co., Inc.: *See*—
Bacino, Elgel J., and Porter. 241,021.
Poulin, Eugene A. Finger ring. 241,062, 8–17–76, Cl. D45—10.
Poulin, Eugene A. Finger ring. 241,063, 8–17–76, Cl. D45—10.
Poulin, Eugene A. Finger ring. 241,064, 8–17–76, Cl. D45—10.
Raskas, Stuart I. Fabric clothing label. 240,976, 8–17–76, Cl. D33—9.
Raskas, Stuart I. Fabric clothing label. 240,977, 8–17–76, Cl. D33—9.
Raskas, Stuart I. Fabric clothing label. 240,978, 8–17–76, Cl. D33—9.
Raskas, Stuart I. Fabric clothing label. 240,979, 8–17–76, Cl. D33—9.
Raskas, Stuart I. Fabric clothing label. 240,980, 8–17–76, Cl. D33—9.
Reed and Barton Corp.: *See*—
Roberts, Margaretta C. 241,065.
Reynolds Erafiska AB: *See*—
Reynold, Mcrie. 241,016.
Robert, Margaretta C., to Reed and Barton Corp. Pendant or similar article. 241,065, 8–17–76, Cl. D45—16.
Rohr, James E.: *See*—
Feldman, Damsky, and Rohr. 240,985.
Rowman, Philip J. Display stand. 240,983, 8–17–76, Cl. D6—27.
Ryan, Vernon L. Playground rope swing or the like. 241,047, 8–17–76, Cl. D34—5.
Salvatore, Albert A., and J. M. Fucci. Golf club rake attachment. 240,998. 8–17–76, Cl. D8—13.
Sandberg, Ulf A., to AB Volvo. Car radio. 241,069, 8–17–76, Cl. D56—4.

Schacht, Arthur, to Crystal Mart, Inc. Lighting fixture. 241,066, 8–17–76, Cl. D48—23.
Schellens, Henricus F. T., to U.S. Philips Corp. Pocket dictating machine. 241,037, 8–17–76, Cl. D26—14.
Scovill Mfg. Co.: *See*—
Levin, Monte L. 240,993.
Sindaco S.A. Switzerland: *See*—
Haas, Peter R. 241,023.
Singer Co., The: *See*—
Genaro, Donald M., and Felix. 241,076.
Smith, Clyde W.: *See*—
McMann, Renville H., Jr., Smith, and Wistrand. 241,072.
Smith, Joseph L. Candle shaper. 241,000, 8–17–76, Cl. D8—98.
Societe Anonym Automobiles Citroren: *See*—
Gonzalez, Boris. 241,026.
Sokolowski, Daniel W.: *See*—
Tesky, Stephen V., and Sokolowski. 240,973.
Tesky, Stephen V., and Sokolowski. 240,974.
Solo, Alan J., to Knock-N-Lok International, Inc. Molded wall fastener having a hook. 241,007, 8–17–76, Cl. D8—271.
Standard Container Co.: *See*—
Barnhart, Charles C., and Cassidy. 241,014.
Stockton, Mary J.: *See*—
Stockton, Sanley C., and Stockton. 241,053.
Stockton, Stanley C., and M. J. Stockton. Solitaire game board. 241,053, 8–17–76, Cl. D34—13.
Summa, James F., and J. R. White, to Uniroyal, Inc. Boot. 240,971, 8–17–76, Cl. D2—272.
Tegner, Raymond U. H., to Amerock Corp. Pull. 241,002, 8–17–76, Cl. D8—169.
Tesky, Stephen V., and D. W. Sokolowski. Shoe. 240,973, 8–17–76, Cl. D2—279.
Tesky, Stephen V., and D. W. Sokolowski. Shoe. 240,974, 8–17–76, Cl. D2—279.
Textron, Inc.: *See*—
Cowan, Murray L 241,061.
Torres, Joseph A. 240,982.
Thomason-CFS Laboratories, Inc.: *See*—
McMann, Renville H., Jr., Smith, and Wistrand. 241,072.
Thomason, Harry J. L., Jr.: *See*—
Thomason, Harry E., and Thomason. 241,031.
Thompson, William B.: *See*—
Brown, Gene T., and Thompson. 241,036.
Torres, Joseph A., to Textron Inc. Neckchain display stand. 240,982, 8–17–76, Cl. D6—20.
Tyme and Tydings Inc.: *See*—
Hubble, Fred R. 241,082.
U.S. Philips Corp.: *See*—
Hugo, Hans J. 240,997.
Schellens, Henricus F. T. 241,037.
Uniroyal, Inc.: *See*—
Summa, James F., and White. 240,971.
Vermont Marble Co.: *See*—
Baker, Charles T. 241,017.
Wallace, Robert S. Hanger bracket. 241,006, 8–17–76, Cl. D8—257.
Wherry Tommy H. Idler pulley. 241,001, 8–17–76, Cl. D8—116.
White, John R.: *See*—
Summa, James F., and White. 240,971.
Winrow, Donald, to Ferranti-Packard Ltd. Display element for forming indicia in a sign. 241,081, 8–17–76, Cl. D96—12.
Wistrand, John C.: *See*—
Smith, McMann, and Wistrand. 241,072.
Wohlstrom, Robert C. Spinning top. 241,055, 8–17–76, Cl. D34—15.
Yale Engineering Co.: *See*—
Di Loreto, Edward. 241,008.
Yanai, Taro. Lighter-pen combination with magnetized telescopic tip. 241,039, 8–17–76, Cl. D27—36.
Yanai, Taro. Cigarette lighter with magnetized telescopic tip. 241,040, 8–17–76, Cl. D27—38.
Young, Carl, to EDI Corp. One-piece cylinder lap tool. 241,059, 8–17–76, Cl. D37—1.
Young, Jack F. Thread cabinet. 240,986, 8–17–76, Cl. D6—157.
Zemby, Bruce G. Backgammon board. 241,048, 8–17–76, Cl. D34—5.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 17, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
61 3,974,525

CLASS 3
1.4 3,974,526
1.912 3,974,527

CLASS 4
10 3,974,528
112 3,974,533

CLASS 5
18R 3,974,529
66 3,974,530
339 3,974,531
345R 3,974,532

CLASS 8
2.5R 3,975,150
14 3,975,151
17 3,975,152
111 3,975,153
116P 3,975,154
155.1 3,974,534

CLASS 9
1.3 3,974,535
14 3,974,536

CLASS 13
10 3,975,575
3,975,576
18 3,975,577
34 3,975,578

CLASS 14
71.3 3,974,537

CLASS 15
21D 3,974,538
104R 3,974,539
306A 3,974,540
320 3,974,541

CLASS 16
35R 3,974,542

CLASS 23
230EP 3,975,157
230B 3,975,156
3,975,158
230R 3,975,155
232E 3,975,159
253TP 3,975,162
253R 3,975,160
253 3,975,161
272.6R 3,975,163
288H 3,975,164

CLASS 24
67.11 3,974,543
68CT 3,974,544
116R 3,974,545
196 3,974,546
201BN 3,974,547
204 3,974,548
205.1C 3,974,549
3,974,550

CLASS 28
49 3,974,551

CLASS 29
33S 3,974,552
38C 3,974,553
121.4 3,974,554
132 3,974,555
182.2 3,975,165
203B 3,974,556
418 3,974,557
451 3,974,558
527.7 3,974,559
590 3,974,560
611 3,974,561

CLASS 30
97 3,974,562
341 3,974,563
350 3,974,564
376 3,974,565
382 3,974,566

CLASS 32
1 3,974,567

CLASS 33
107R 3,974,568
143R 3,974,569
147T 3,974,570
174S 3,974,571

CLASS 34
10 3,974,572
48 3,974,573
57E 3,974,574

CLASS 35
9A 3,974,575
28 3,974,576
46R 3,974,577

CLASS 36
72R 3,974,578

CLASS 37
141T 3,974,579
189 3,974,580

CLASS 40
20R 3,974,581
106.1 3,974,582
130E 3,974,583
130R 3,974,584

CLASS 42
1S 3,974,585
3,974,586

CLASS 43
15 3,974,588
42.19 3,974,587
43.12 3,974,589
43.14 3,974,590
3,974,591
88 3,974,592

CLASS 44
7D 3,975,166

CLASS 46
22 3,974,593

CLASS 48
190 3,975,167
197R 3,975,168
214A 3,975,169

CLASS 51
3 3,974,594
5D 3,974,595
17E 3,974,596
281R 3,974,597
358 3,974,598

CLASS 52
20 3,974,599
81 3,974,600
86 3,974,601
93 3,974,602
160 3,974,604
166 3,974,603
169R 3,974,605
232 3,974,607
235 3,974,608
273 3,974,609
285 3,974,610
288 3,974,606
309 3,974,611
3,974,612
400 3,974,613
573 3,974,614
698 3,974,615
726 3,974,619
738 3,974,616
741 3,974,617
745 3,974,618
747 3,974,620
758F 3,974,621

CLASS 53
7 3,974,622
29 3,974,623
160 3,974,624
189 3,974,625
244 3,974,626
261 3,974,627
291 3,974,628

CLASS 55
16 3,975,170
36 3,975,171
40 3,975,172
96 3,975,173

CLASS 56
13.7 3,974,629
202 3,974,631
295 3,974,630
341 3,974,632

CLASS 57
1R 3,974,633
57 3,974,634
58.95 3,974,635

CLASS 58
23R 3,974,636
50R 3,974,637
3,974,638
86 3,974,639

CLASS 59
85 3,974,640
93 3,974,641

CLASS 60
39.18B 3,974,642
3,974,643
3,974,644
39.29 3,974,645
39.65 3,974,646
39.72P 3,974,647
204 3,974,648
271 3,974,649
282 3,974,650
290 3,974,651
398 3,974,652
716 3,974,653

CLASS 61
17 3,974,654
30 3,974,655
35 3,974,656
50 3,974,657

CLASS 62
60 3,974,658
84 3,974,659
229 3,974,660
262 3,974,661

CLASS 63
15 3,974,662

CLASS 65
22 3,975,174
31 3,975,175
38 3,975,176
158 3,975,177

CLASS 66
26 3,974,663
154A 3,974,664
163 3,974,665

CLASS 68
8 3,974,666
17R 3,974,667

CLASS 70
14 3,974,668
276 3,974,669
364A 3,974,670
375 3,974,671

CLASS 71
34 3,975,178
90 3,975,179
103 3,975,180
113 3,975,181

CLASS 72
21 3,974,672
38 3,974,673
42 3,974,674
56 3,974,675
307 3,974,676
340 3,974,677

CLASS 73
7 3,974,678
15.6 3,974,679
40.5R 3,974,680
67.5R 3,974,681
67.7 3,974,682
71.5US 3,974,684
88F 3,974,685
95 3,974,686
126 3,974,687
3,974,688
146 3,974,689
151 3,974,690
190R 3,974,691
194A Re.28,929
3,974,692
3,974,693
272A 3,974,694
304C 3,974,695
352 3,974,696
422R 3,974,697
425.6 3,974,698
432PS 3,974,683
432R 3,974,699
468 3,974,700
504 3,974,701

CLASS 74
5.6B 3,974,702
6 3,974,703
10.33 3,974,704
53 3,974,705
89.15 3,974,706
217B 3,974,707
242.1A 3,974,708
424.8A 3,974,709
465 3,974,710
473R 3,974,711
479 3,974,712
512 3,974,713
571L 3,974,714
571R 3,974,715
661 3,974,716
713 3,974,717
750R 3,974,718
810 3,974,719
866 3,974,720

CLASS 75
.5AA 3,975,186
.5B 3,975,184
3 3,975,182
3,975,183
5 3,975,185
10R 3,975,187
14 3,975,188
101R 3,975,189
3,975,190
130R 3,975,191
169 3,975,192
211 3,975,193
222 3,975,194

CLASS 82
3 3,974,721

CLASS 83
1 3,974,722
18 3,974,723
68 3,974,724
100 3,974,725
157 3,974,726
174 3,974,727
686 3,974,728

CLASS 84
1.03 3,974,729
291 3,974,730
404 3,974,731
421 3,974,732
473 3,974,733

CLASS 85
67 3,974,734
72 3,974,735

CLASS 86
23 3,974,736

CLASS 89
1.82 3,974,737
34 3,974,738
3,974,739
41SW 3,974,740

CLASS 91
376R 3,974,741
420 3,974,742
422 3,974,743
454 3,974,744

CLASS 92
127 3,974,745
244 3,974,746

CLASS 93
8VB 3,974,747
61A 3,974,748
61R 3,974,749
77FT 3,974,750
84R 3,974,751

CLASS 96
1PS 3,975,195
1.5 3,975,196
36.1 3,975,198
66.4 Re.28,934
86R 3,975,197
100 3,975,199

CLASS 98
1.5 3,974,752
2.14 3,974,753
33A 3,974,754
40D 3,974,755
58 3,974,756
119 3,974,757

CLASS 99
275 3,974,758
386 3,974,759
482 3,974,760

CLASS 100
7 3,974,761
9 3,974,762
35 3,974,763
269R 3,974,764

CLASS 101
111 3,974,765
129 3,974,766
151 3,974,767
425 3,974,768
426 3,974,769

CLASS 102
42C 3,974,770
67 3,974,771
70.2 3,974,772
81 3,974,773
90 3,974,774
95 3,974,775

CLASS 104
26A 3,974,776
94 3,974,777
148LM 3,974,778

CLASS 105
164 3,974,779
178 3,974,780
243 3,974,781

CLASS 106
38.22 3,975,200
48 3,975,201
65 3,975,202
299 3,975,203

CLASS 108
83 3,974,782

CLASS 110
8R 3,974,783
3,974,784

CLASS 112
113 3,974,785
121.12 3,974,786
3,974,787
140 3,974,788

CLASS 114
.5F 3,974,789
66.5S 3,974,790
103 3,974,791
144B 3,974,792
210 3,974,793
230 3,974,794

CLASS 116
114PV 3,974,795

CLASS 118
4 3,974,796
54 3,974,797

CLASS 119
1 3,974,798
106 3,974,800

CLASS 123
18R 3,974,801
25R 3,974,802
32SP 3,974,818
42 3,974,803
59BM 3,974,804
118 3,974,805
119A 3,974,807
119R 3,974,806
122D 3,974,808
139AW 3,974,809
3,974,811
139ST 3,974,812
3,974,814
139R 3,974,810
140MC 3,974,813
148CC 3,974,815
3,974,816
149C 3,974,817

CLASS 124
17 3,974,819
20R 3,974,820

CLASS 126
25B 3,974,821
271 3,974,822
3,974,823
3,974,824

CLASS 127
42 3,975,204
46A 3,975,205
71 3,975,206

CLASS 128
1D 3,974,825
2V 3,974,826
70 3,974,827
145.8 3,974,828
146.2 3,974,829
212 3,974,830
218D 3,974,831
221 3,974,832
275.1 3,974,833
334C 3,974,835
418 3,974,834
526 3,974,836

CLASS 130
27S 3,974,837

CLASS 131
17R 3,974,838
136 3,974,839

CLASS 132
9 3,974,840
40 3,974,841
91 3,974,842

CLASS 134
6 3,975,207
10 3,975,208
95 3,974,843

CLASS 136
83T 3,975,209
86A 3,975,210
89 3,975,211
232 3,975,212

CLASS 137
1 3,974,844
3,974,845
15 3,974,846
101.11 3,974,847
102 3,974,848
221 3,974,849
493.9 3,974,850
494 3,974,851
498 3,974,852
503 3,974,853
512 3,974,854
527.4 3,974,855
552 3,974,856
559 3,974,857
606 3,974,858
625.3 3,974,860
625.37 3,974,859
627.5 3,974,861

CLASS 138
37 3,974,862
158 Re.28,930

CLASS 141
18 3,974,863
100 3,974,864
311R 3,974,865

CLASS 144
3D 3,974,866
193A 3,974,867

CLASS 145
24 3,974,868

CLASS 148
1.5 3,975,213
6.15R 3,975,214
6.17 3,975,215
11.5P 3,975,219
23 3,975,216
105 3,975,217

175 3,975,218
187 3,975,220
191 3,975,221

CLASS 152

220 3,974,871
352R 3,974,870

CLASS 156

62.2 3,975,222
85 3,975,223
167 3,975,224
242 3,975,225
358 3,975,226
361 3,975,227

CLASS 159

16A 3,975,228
31 3,975,229
47R 3,975,230
3,975,231

CLASS 162

65 3,975,232

CLASS 164

40 3,974,872
108 3,974,873
281R 3,974,874

CLASS 166

5 3,974,875
65R 3,974,876
276 3,974,877
314 3,974,878

CLASS 169

43 3,974,879

CLASS 172

443 3,974,880
803 3,974,881
3,974,882

CLASS 173

12 3,974,883
3,974,884
121 3,974,885

CLASS 174

18 3,975,579
45R 3,975,580
153R 3,975,582

CLASS 175

76 3,974,886

CLASS 176

86R 3,975,233

CLASS 177

4 3,974,887
52 3,974,888
134 3,974,889

CLASS 178

5 3,975,590
5.1 3,975,585
5.6 3,975,583
6 3,975,584
7.2 3,975,591
7.5R 3,975,586
18 3,975,592

CLASS 179

1FS 3,975,588
1SA 3,975,587
24AM 3,975,589
15BB 3,975,594
15BV 3,975,593
18BA 3,975,595
18BC 3,975,596
27D 3,975,597
100.1B 3,975,598
107FD 3,975,599
175.3A 3,975,600

CLASS 180

5R 3,974,890
9.44 3,974,891
32 3,974,892
105E 3,974,893

CLASS 182

113 3,974,894

CLASS 188

76 3,974,895
170 3,974,896
196A 3,974,897

CLASS 190

3 3,974,898

CLASS 192

3M 3,974,899
61 3,974,900
83 3,974,901
84T 3,974,902
106.2 3,974,903

CLASS 193

38 3,974,904

CLASS 195

28R 3,975,234
29 3,975,235
36P 3,975,236
63 3,975,237
103.5R 3,975,238
108 3,975,239

CLASS 197

98 3,974,905
168 3,974,906

CLASS 198

92 3,974,907
93 3,974,908
155 3,974,909
203 3,974,910

CLASS 200

11R 3,975,601
61.21 3,975,605
148A 3,975,602
301 3,975,603
303 3,975,604

CLASS 201

1 3,975,240

CLASS 202

202 3,975,241

CLASS 204

72 3,975,243
108 3,975,244
129.95 3,975,245
151 3,975,246
152 3,975,247
157.1S 3,975,248
159.14 3,975,249
181 3,975,250
3,975,251
192 3,975,252
195R 3,975,253
228 3,975,254
252 3,975,255
275 3,975,256
299R 3,975,257

CLASS 206

141 3,974,911
303 3,974,912
344 3,974,913
408 3,974,914
423 3,974,915
459 3,974,916

CLASS 208

28 3,975,242
213 3,975,259
309 3,975,396

CLASS 209

73 3,975,260
74M Re.28,931
3,975,261
111.6 3,975,262
138 3,975,263
166 3,975,264
3,975,265

CLASS 210

10 3,975,266
35 3,975,267
36 3,975,268
44 3,975,269
53 3,975,270
62 3,975,271
88 3,975,272
74 3,975,273
82 3,975,274
160 3,975,275
207 3,975,276

CLASS 211

36 3,974,917
43 3,974,918

CLASS 214

1BT 3,974,919
1F 3,974,920
7 3,974,921
8.5K 3,974,922
15R 3,974,923
84 3,974,924
147G 3,974,925
352 3,974,926
730 3,974,927

CLASS 215

211 3,974,928
216 3,974,929
247 3,974,930
254 3,974,931
256 3,974,932

CLASS 219

10.55F 3,975,606
69NN 3,975,608
69M 3,975,607
3,975,609
76 3,975,610
98 3,975,611
121EB 3,975,613
121EM 3,975,612
126 3,975,614
3,975,615
131F 3,975,616
269 3,975,619
300 3,975,617
364 3,975,620
388 3,975,618

CLASS 220

3.8 3,974,933
4F 3,974,934
9LG 3,974,935
204 3,974,936
239 3,974,937
266 3,974,938

CLASS 222

1 3,974,939
52 3,974,940
70 3,974,941
83.5 3,974,942
103 3,974,943
192 3,974,945
197 3,974,944

CLASS 223

34 3,974,946

CLASS 225

25 3,974,947

CLASS 226

38 3,974,948
42 3,974,949
107 3,974,950
143 3,974,951
189 3,974,952
3,974,953

CLASS 227

19 Re.28,932

CLASS 228

13 3,974,954
256 3,974,955

CLASS 229

20 3,974,956
55 3,974,957
3,974,958
3,974,959
62 3,974,960

CLASS 232

16 3,974,961

CLASS 235

132R 3,974,962
150.26 3,975,621
151.1 3,975,622
152 3,975,623
175 3,975,624
189 3,975,625

CLASS 238

382 3,974,963

CLASS 239

11 3,974,964
413 3,974,965
590.3 3,974,966
656 3,974,967

CLASS 240

102R 3,975,627

CLASS 241

11 3,974,968
98 3,974,969
222 3,974,970
261.3 3,974,971

CLASS 242

18PW 3,974,972
41 3,974,973
55 3,974,974
55.19A 3,974,975
75.5 3,974,976
84.1R 3,974,977
3,974,978
107.4R 3,974,979
128 3,974,980
182 3,974,981
192 3,974,982
194 3,974,983

CLASS 244

3.11 3,974,984
3.16 3,974,985
40R 3,974,986
42CC 3,974,987
103R 3,974,988
126 3,974,989
137R 3,974,990

CLASS 246

34CT 3,974,991
182B 3,974,992
428 3,974,993

CLASS 248

23 3,974,994

CLASS 249

19 3,974,995
112 3,974,996
142 3,974,997

CLASS 250

199 3,975,628
201 3,975,629
202 3,975,630
211R 3,975,631
212 3,975,632
237R 3,975,633
302 3,975,634
315A 3,975,626
3,975,635
327 3,975,636
3,975,637
385 3,975,638
3,975,639
3,975,640
393 3,975,641
468 3,975,642
551 3,975,643
563 3,975,644

CLASS 251

76 3,974,998
309 3,974,869

CLASS 252

2 3,975,277
59 3,975,278
78.5 3,975,279
102 3,975,280
180 3,975,281
3,975,282
182 3,975,283
187R 3,975,284
299 3,975,285
3,975,286
3,975,287
3,975,288
3,975,289
300 3,975,290
301.1R 3,975,291
301.17 3,975,292
305 3,975,293
317 3,975,294
354 3,975,295
357 3,975,296
383 3,975,297
400R 3,975,298
430 3,975,299
432 3,975,300
435 3,975,301
437 3,975,302
455R 3,975,303
462 3,975,304
463 3,975,305
500 3,975,306
501 3,975,307
520 3,975,308
3,975,309
522 3,975,310
3,975,311
535 3,975,312
542 3,975,313

CLASS 254

28 3,974,999

CLASS 256

59 3,975,000

CLASS 259

72 3,975,001
148 3,975,002

CLASS 260

2EP 3,975,314
2.5AC 3,975,317
2.5AK 3,975,316
2.5B 3,975,327
2.5F 3,975,318
3,975,319
2.5R 3,975,315
17R 3,975,320
18EP 3,975,322
18PF 3,975,321
22D 3,975,323
23TN 3,975,324
23XA 3,975,325
23H 3,975,326
29.2EP 3,975,346
3,975,347
29.2N 3,975,345
29.6NR 3,975,348
29.7R 3,975,349
30.4N 3,975,350
30.8R 3,975,351
33.8F 3,975,352
40R 3,975,353
3,975,354
3,975,355
42.47 3,975,414
45.7S 3,975,356
45.75A 3,975,359
45.75N 3,975,358
45.8N 3,975,357
45.85R 3,975,360
46.5G 3,975,362
46.5R 3,975,361
47UA 3,975,363
63R 3,975,328
75N 3,975,330
75T 3,975,329
78R 3,975,331
79.5C 3,975,333
112R 3,975,342
3,975,343
3,975,344
112.5R 3,975,365
3,975,366
3,975,367
145B 3,975,369
151 3,975,370
198 3,975,371
239.1 3,975,375
3,975,376
239.3B Re.28,935
239.3R 3,975,377
239.55D 3,975,378
240E 3,975,379
240G 3,975,382
240R 3,975,380
3,975,381
243C 3,975,383
3,975,385
243R 3,975,384
244A 3,975,386
247.5R 3,975,387
250A 3,975,388
254 3,975,389
268PH 3,975,390
288R 3,975,391
293.52 3,975,392
294.8K 3,975,393
306 3,975,394
308D 3,975,395
309.5 3,975,397
315 3,975,398
326.2 3,975,399
326.26 3,975,401
326.5FN 3,975,400
326.82 3,975,402
327P 3,975,403
343.3 3,975,404
343.4 3,975,405
346.2R 3,975,406
346.8A 3,975,407
346.8R 3,975,408
348.5L 3,975,409
376 3,975,410
378 3,975,411
397.1 3,975,413
397.4 3,975,412
429R 3,975,415
429.2 3,975,416
429.7 3,975,417
453AR 3,975,418
455A 3,975,419
456P 3,975,420
464 3,975,421
465G 3,975,424
465.1 3,975,423
465.4 3,975,422
466 3,975,425
468D 3,975,426
470 3,975,427
472 3,975,428
473R 3,975,429
485H 3,975,364
513B 3,975,430
515R 3,975,431
520R 3,975,432
552R 3,975,433
556B 3,975,434
558D 3,975,443
558P 3,975,435
3,975,437
570.5R 3,975,436
571 3,975,444
578 3,975,438
581 3,975,439
586C 3,975,440
586R 3,975,441
3,975,442
590C 3,975,445
593R 3,975,446
606.5P 3,975,447
611A 3,975,448
635E 3,975,449
635P 3,975,450
635Y 3,975,451
645 3,975,452
665R 3,975,453
672R 3,975,454
827 3,975,455
836 3,975,456
859R 3,975,457
876B 3,975,459
3,975,460
876R 3,975,458
879 3,975,461
880R 3,975,462
897B 3,975,463
923 3,975,464
927R 3,975,465

CLASS 261

18A 3,975,466
30 3,975,467
65 3,975,468
87 3,975,469
106 3,975,470

CLASS 264

5 3,975,471
14 3,975,472
23 3,975,473
3,975,474
28 3,975,475
33 3,975,476
35 3,975,477
41 3,975,478
102 3,975,479
113 3,975,480
126 3,975,481
131 3,975,482
137 3,975,483
168 3,975,484
171 3,975,485
182 3,975,486
210F 3,975,487
3,975,488
222 3,975,489
250 3,975,490
255 3,975,491
263 3,975,492
292 3,975,493
329 3,975,494

CLASS 266

56 3,975,003
210 3,975,004

CLASS 267

47 3,975,005
139 3,975,006
152 3,975,007
181 3,975,008

CLASS 270

68A 3,975,009

CLASS 271

4 3,975,010
157 3,975,011
183 3,975,012
275 3,975,013

CLASS 273

45 3,975,014
54B 3,975,015
58R 3,975,016
73H 3,975,017
73R 3,975,018
105.2 3,974,799
121A 3,975,019
131AB 3,975,020
135B 3,975,021
141A 3,975,022
173 3,975,023
193R 3,975,024

CLASS 274

37 3,975,025

CLASS 277

4 3,975,026
84 3,975,027
94 3,975,028

CLASS 279

1C 3,975,029
4 3,975,030
14 3,975,031
30 3,975,032

CLASS 280

11.37E 3,975,036
618 3,975,033
3,975,034
621 3,975,035
700 3,975,038
733 3,975,037
3,975,258

CLASS 285

156 3,975,039

CLASS 292

258 3,975,041
318 3,975,040

CLASS 293

61 3,975,042

CLASS 294

25 3,975,043
70 3,975,044
86R 3,975,045

CLASS 296

28M 3,975,046
100 3,975,047
137B 3,975,048
3,975,049

CLASS 297

328 3,975,050
434 3,975,051

CLASS 298

1B 3,975,052

CLASS 299

7 3,975,053
8 3,975,054
39 3,975,055
42 3,975,056

CLASS 302

31 3,975,057
50 3,975,058

CLASS 303

6C 3,975,059
3,975,060
21AF 3,975,061
22R 3,975,062

CLASS 307

10AT 3,975,645

21	3,975,646
228	3,975,647
297	3,975,648
304	3,975,649
CLASS 308	
3.8	3,975,063
6C	3,975,064
73	3,975,065
201	3,975,066
216	3,975,067
CLASS 310	
8.1	3,975,650
11	3,975,651
41	3,975,652
172	3,975,654
196	3,975,653
260	3,975,655
CLASS 312	
254	3,975,068
262	3,975,069
322	3,975,070
323	3,975,071
CLASS 313	
397	3,975,656
CLASS 315	
10	3,975,657
71	3,975,658
72	3,975,659
102	3,975,660
169TV	3,975,661
378	3,975,662
CLASS 317	
18R	3,975,663
66	3,975,664
101DH	3,975,665
151	3,975,666
CLASS 318	
39	3,975,667
212	3,975,668
624	3,975,669
CLASS 320	
13	3,975,670
CLASS 321	
15	3,975,671
CLASS 323	
17	3,975,672
119	3,975,673
CLASS 324	
.5A	3,975,675
1	3,975,674
9	3,975,676
28	3,975,677
34ST	3,975,685
56	3,975,678
58.5B	3,975,679
61P	3,975,680
71R	3,975,681
142	3,975,682
158D	3,975,683
185	3,975,684

CLASS 325	
38B	3,975,686
304	3,975,687
392	3,975,688
CLASS 328	
237	3,975,689
CLASS 330	
5	3,975,690
107	3,975,691
CLASS 331	
94.5C	3,975,693
94.5M	3,975,692
94.5Q	3,975,694
CLASS 333	
24R	3,975,695
30R	3,975,696
	3,975,697
	3,975,698
33	3,975,581
70R	3,975,699
84L	3,975,700
CLASS 335	
176	3,975,701
CLASS 337	
62	3,975,702
374	3,975,703
CLASS 339	
17LC	3,975,072
17L	3,975,076
53	3,975,073
89R	3,975,074
102R	3,975,075
177R	3,975,077
221M	3,975,078
278C	3,975,079
CLASS 340	
3F	3,975,704
15.5DS	3,975,705
52A	3,975,706
80	3,975,708
146.3C	3,975,710
146.3E	3,975,711
146.3H	3,975,709
147R	3,975,712
149R	3,975,713
172.5	3,975,714
	3,975,715
	3,975,716
173R	3,975,717
	3,975,718
200	3,975,719
228R	3,975,720
251	3,975,721
261	3,975,722
274R	3,975,723
286	3,975,724
324M	3,975,725
336	3,975,726
347NT	3,975,727
373	3,975,728

CLASS 343	
5PD	3,975,729
6R	3,975,730
7.3	3,975,731
7.7	3,975,734
16R	3,975,732
112R	3,975,735
113R	3,975,736
770	3,975,733
	3,975,737
872	3,975,738
CLASS 346	
74ES	3,975,739
75	3,975,740
	3,975,741
76R	3,975,707
	3,975,742
91	3,975,743
CLASS 350	
3.5	3,975,080
	3,975,081
96C	3,975,082
103	3,975,083
160LC	3,975,085
160R	3,975,086
175ML	3,975,087
175E	3,975,088
184	3,975,089
214	3,975,090
	3,975,091
CLASS 351	
164	3,975,092
	3,975,093
CLASS 353	
35	3,975,094
69	3,975,095
CLASS 354	
7	3,975,745
29	3,975,744
51	3,975,746
60E	3,975,747
195	3,975,749
225	3,975,750
CLASS 355	
15	3,975,096
CLASS 356	
30	3,975,097
85	3,975,098
89	3,975,099
103	3,975,084
106R	3,975,100
162	3,975,101
167	3,975,102
184	3,975,103
246	3,975,104
CLASS 357	
2	3,975,755
19	3,975,751
22	3,975,752

24	3,975,753
38	3,975,754
63	3,975,756
72	3,975,757
74	3,975,758
CLASS 358	
4	3,975,759
41	3,975,760
65	3,975,766
78	3,975,748
	3,975,761
81	3,975,762
CLASS 360	
8	3,975,763
23	3,975,764
60	3,975,765
88	3,975,767
99	3,975,768
	3,975,769
103	3,975,770
104	3,975,771
113	3,975,772
126	3,975,773
130	3,975,774
CLASS 402	
1	3,975,105
CLASS 403	
271	3,975,107
374	3,975,106
CLASS 404	
16	3,975,108
CLASS 408	
35	3,975,109
228	3,975,110
239R	3,975,111
CLASS 415	
116	3,975,112
180	3,975,113
217	3,975,114
CLASS 417	
38	3,975,115
311	3,975,116
370	3,975,117
424	3,975,118
434	3,975,119
CLASS 418	
48	3,975,120
	3,975,121
61B	Re.28,933
83	3,975,122
97	3,975,123
132	3,975,124
142	3,975,125
CLASS 423	
55	3,975,495
122	3,975,496
140	3,975,497
239	3,975,498
266	3,975,499

281	3,975,500
351	3,975,501
372	3,975,502
421	3,975,503
449	3,975,504
478	3,975,505
	3,975,506
561	3,975,507
571	3,975,508
626	3,975,509
628	3,975,510
CLASS 424	
1.5	3,975,511
5	3,975,512
19	3,975,513
52	3,975,514
72	3,975,515
81	3,975,516
87	3,975,517
173	3,975,518
180	3,975,519
181	3,975,520
184	3,975,521
200	3,975,522
212	3,975,523
246	3,975,524
250	3,975,525
	3,975,526
	3,975,527
260	3,975,368
263	3,975,528
265	3,975,529
270	3,975,530
274	3,975,531
	3,975,532
	3,975,534
279	3,975,535
283	3,975,536
285	3,975,537
301	3,975,538
304	3,975,539
315	3,975,540
325	3,975,541
326	3,975,533
353	3,975,542
	3,975,543
CLASS 425	
141	3,975,126
193	3,975,127
207	3,975,128
387B	3,975,129
404	3,975,130
405H	3,975,131
406	3,975,132
431.2	3,975,133
504	3,975,134
CLASS 426	
35	3,975,544
40	3,975,545
49	3,975,546
106	3,975,547
243	3,975,552

513	3,975,548
550	3,975,549
553	3,975,550
637	3,975,551
656	3,975,553
CLASS 427	
8	3,975,554
85	3,975,555
122	3,975,556
126	3,975,557
140	3,975,558
146	3,975,559
341	3,975,560
CLASS 428	
67	3,975,561
95	3,975,562
143	3,975,563
174	3,975,564
284	3,975,565
290	3,975,566
315	3,975,567
329	3,975,568
	3,975,569
355	3,975,570
371	3,975,571
452	3,975,572
480	3,975,573
483	3,975,574
CLASS 431	
43	3,975,135
74	3,975,136
79	3,975,137
161	3,975,138
208	3,975,139
329	3,975,140
352	3,975,141
CLASS 432	
3	3,975,142
5	3,975,143
	3,975,144
10	3,975,145
59	3,975,146
80	3,975,147
106	3,975,148
209	3,975,149
CLASS 526	
15	3,975,332
19	3,975,334
283	3,975,335
303	3,975,341
312	3,975,340
335	3,975,336
341	3,975,337
345	3,975,338
347	3,975,339
CLASS 536	
7	3,975,373
17	3,975,372
23	3,975,374

CLASSIFICATION OF DESIGNS

D2—	232	240,970
	272	240,971
	275	240,972
	279	240,973
		240,974
	361	240,975
D4—	25	240,981
D6—	20	240,982
	27	240,983
	37	240,984
	85	240,985
	157	240,986
	181	240,987
	195	240,988
	247	240,989
		240,990
D7—	.1	241,076
	9	240,991
	43	240,992
	94	240,993
	96	240,994
	136	240,995
	153	240,996
	202	240,997
D8—	13	240,998
	22L	241,004
	38	240,999
	98	241,000
	116	241,001
	169	241,002
	203	241,003
	229	241,005
	257	241,006
	271	241,007
	272	241,008
D9—	2	241,009
	10	241,010
	141	241,011
	151	241,012
	160	241,013
	180	241,014
	184	241,015
	193	241,016
	216	241,017
	281	241,018
D10—	62	241,019
	91	241,020
	96	241,021
	111	241,022
	132	241,023
D12—	56	241,024
	69	241,025
	91	241,026
	104	241,027
	169	241,028
	185	241,029
	187	241,030
D16—	3	241,073
D23—	11	241,032
	139	241,033
D25—	17	241,031
D26—		241,036
	1A	241,034
	5C	241,035
	14B	241,037
	E	241,072
	G	241,038
D27—	36	241,039
	38	241,040
D30—	13	241,041
D32—	2C	241,042
D33—	9	240,976
		240,980
		240,977
		240,978
		240,979
D34—	2R	241,043
	4	241,044
	5GP	241,045
	SS	241,046
		241,048
	M	241,047
	11R	241,049
		241,050
		241,051
	13A	241,052
		241,053
	15AH	241,055
	GG	241,054
	W	241,056
D35—	3A	241,057
		241,058
D37—	1R	241,059
D40—	A	241,060
D45—	4E	241,061
	10B	241,062
		241,063
		241,064
	16	241,065
D48—	23R	241,066
D56—	4B	241,067
		241,068
		241,069
	R	241,070
D59—	2B	241,071
D64—	11R	241,074
	17	241,075
D77—	1A	241,077
D83—	12R	241,078
D87—	1	241,079
D95—	3A	241,080
D96—	12K	241,081
	R	241,082

CLASSIFICATION OF PLANTS

P. —	9	3,940

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama 1
Alaska 2
American Samoa 3
Arizona 4
Arkansas 5
California 6
Canal Zone 7
Colorado 8
Connecticut 9
Delaware 10
District of Columbia 11
Florida 12
Georgia 13
Guam 14
Hawaii 15
Idaho 16
Illinois 17
Indiana 18
Iowa 19
Kansas 20
Kentucky 21
Louisiana 22
Maine 23
Maryland 24
Massachusetts 25
Michigan 26
Minnesota 27
Mississippi 28
Missouri 29
Montana 30
Nebraska 31
Nevada 32
New Hampshire 33
New Jersey 34
New Mexico 35
New York 36
North Carolina 37
North Dakota 38
Ohio 39
Oklahoma 40
Oregon 41
Pennsylvania 42
Puerto Rico 43
Rhode Island 44
South Carolina 45
South Dakota 46
Tennessee 47
Texas 48
Utah 49
Vermont 50
Virginia 51
Virgin Islands 52
Washington 53
West Virginia 54
Wisconsin 55
Wyoming 56
U.S. Air Force 57
U.S. Army 58
U.S. Navy 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,975,178
3,975,583
3,975,695
2 : 3,975,073
4 : 3,974,538
3,975,680
3,975,712
5 : 3,975,144
6 : Re.28,929
3,974,537
3,974,552
3,974,566
3,974,567
3,974,582
3,974,598
3,974,599
3,974,600
3,974,614
3,974,620
3,974,621
3,974,638
3,974,652
3,974,658
3,974,668
3,974,676
3,974,686
3,974,687
3,974,688
3,974,699
3,974,701
3,974,710
3,974,722
3,974,744
3,974,746
3,974,751
3,974,752
3,974,753
3,974,762
3,974,772
3,974,775
3,974,778
3,974,792
3,974,796
3,974,802
3,974,820
3,974,824
3,974,827
3,974,828
3,974,841
3,974,847
3,974,853
3,974,863
3,974,895
3,974,898
3,974,905
3,974,906
3,974,913
3,974,915
3,974,920
3,974,932
3,974,941
3,974,945
3,974,946
3,974,985
3,974,987
3,974,990
3,974,996
3,974,999
3,975,003
3,975,014
3,975,015
3,975,016
3,975,017
3,975,021
3,975,032
3,975,041
3,975,051
3,975,057
3,975,063
3,975,075
3,975,104
3,975,109
3,975,115
3,975,116
3,975,117
3,975,120
3,975,121
3,975,126
3,975,143
3,975,173
3,975,216
3,975,221
3,975,237
3,975,260
3,975,270
3,975,286
3,975,288
3,975,289
3,975,334
3,975,342
3,975,363
3,975,378
3,975,419
3,975,427
3,975,429
3,975,432
3,975,449
3,975,540
3,975,600
3,975,628
3,975,629
3,975,633
3,975,634
3,975,645
3,975,648
3,975,668
3,975,669
3,975,671
3,975,674
3,975,678
3,975,724
3,975,735
3,975,741
3,975,748
3,975,753
3,975,755
3,975,757
3,975,772
8 : 3,975,006
3,975,026
3,975,036
3,975,058
3,975,065
3,975,077
3,975,142
3,975,273
3,975,477
3,975,684
3,975,723
3,975,768
9 : Re.28,932
3,974,628
3,974,646
3,974,648
3,974,654
3,974,672
3,974,749
3,974,832
3,974,904
3,974,933
3,974,966
3,974,982
3,974,989
3,975,024
3,975,074
3,975,083
3,975,102
3,975,112
3,975,141
3,975,170
3,975,196
3,975,245
3,975,395
3,975,453
10 : 3,974,723
3,975,325
3,975,399
3,975,415
3,975,464
3,975,518
3,975,532
11 : 3,974,773
12 : 3,974,571
3,974,591
3,974,647
3,974,655
3,974,702
3,974,725
3,974,732
3,974,925
3,974,980
3,975,018
3,975,097
3,975,160
3,975,219
3,975,405
3,975,480
3,975,545
3,975,585
3,975,627
3,975,752
13 : 3,974,593
3,974,609
3,974,653
3,974,763
3,974,833
3,975,158
3,975,208
3,975,554
16 : 3,974,890
3,975,549
3,975,551
3,975,641
17 : Re.28,930
3,974,543
3,974,568
3,974,573
3,974,579
3,974,607
3,974,608
3,974,619
3,974,715
3,974,724
3,974,738
3,974,742
3,974,770
3,974,787
3,974,803
3,974,836
3,974,873
3,974,882
3,974,896
3,974,919
3,974,922
3,974,927
3,974,947
3,974,958
3,974,959
3,974,961
3,974,964
3,974,969
3,975,001
3,975,019
3,975,110
3,975,118
3,975,183
3,975,185
3,975,198
3,975,206
3,975,209
3,975,222
3,975,265
3,975,269
3,975,305
3,975,314
3,975,320
3,975,340
3,975,344
3,975,347
3,975,365
3,975,512
3,975,566
3,975,604
3,975,664
3,975,715
18 : 3,974,603
3,974,689
3,974,782
3,974,826
3,974,837
3,974,929
3,974,975
3,974,986
3,975,040
3,975,226
3,975,272
3,975,542
3,975,543
3,975,568
19 : 3,974,592
3,974,851
3,974,926
20 : 3,975,276
3,975,348
3,975,508
21 : 3,974,667
3,974,696
3,975,720
22 : 3,974,528
3,974,601
3,974,606
3,974,911
3,975,152
3,975,154
3,975,171
3,975,343
3,975,370
3,975,490
3,975,497
3,975,507
3,975,560
23 : 3,975,132
3,975,162
24 : 3,974,678
3,974,693
3,974,706
3,974,730
3,974,758
3,974,774
3,974,909
3,974,917
3,975,050
3,975,138
3,975,184
3,975,264

3,975,292
3,975,516
3,975,679
3,975,690
25 : 3,974,536
3,974,578
3,974,581
3,974,584
3,974,681
3,974,761
3,974,844
3,974,892
3,974,960
3,975,056
3,975,080
3,975,084
3,975,092
3,975,093
3,975,137
3,975,241
3,975,423
3,975,474
3,975,482
3,975,592
3,975,599
3,975,601
3,975,611
3,975,621
3,975,625
3,975,676
3,975,702
3,975,708
3,975,711
3,975,732
3,975,736
3,975,744
3,975,767
3,975,770
26 : 3,974,541
3,974,546
3,974,558
3,974,610
3,974,650
3,974,660
3,974,708
3,974,713
3,974,736
3,974,795
3,974,808
3,974,897
3,974,918
3,974,983
3,975,007
3,975,008
3,975,030
3,975,038
3,975,048
3,975,068
3,975,108
3,975,111
3,975,191
3,975,192
3,975,214
3,975,257
3,975,266
3,975,279
3,975,362
3,975,367
3,975,371
3,975,374
3,975,393
3,975,404
3,975,426
3,975,431
3,975,433
3,975,455
3,975,456
3,975,466
3,975,468
3,975,470

3,975,492
3,975,493
3,975,521
3,975,557
3,975,609
3,975,652
3,975,654
3,975,774
27 : Re.28,933
3,974,529
3,974,533
3,974,588
3,974,626
3,974,834
3,974,894
3,974,902
3,974,949
3,975,182
3,975,197
3,975,563
3,975,688
3,975,719
3,975,769
28 : 3,975,283
29 : 3,974,781
3,974,821
3,975,094
3,975,135
3,975,136
3,975,278
3,975,408
3,975,580
31 : 3,974,631
32 : 3,975,002
33 : 3,975,579
3,975,662
3,975,704
34 : 3,974,526
3,974,556
3,974,560
3,974,575
3,974,576
3,974,759
3,974,784
3,974,801
3,974,874
3,974,931
3,974,967
3,975,069
3,975,086
3,975,134
3,975,153
3,975,155
3,975,156
3,975,168
3,975,193
3,975,243
3,975,252
3,975,296
3,975,300
3,975,316
3,975,321
3,975,323
3,975,324
3,975,341
3,975,350
3,975,358
3,975,372
3,975,386
3,975,394
3,975,396
3,975,422
3,975,435
3,975,440
3,975,442
3,975,473
3,975,481
3,975,499
3,975,501
3,975,528

3,975,555
3,975,584
3,975,587
3,975,632
3,975,672
3,975,699
3,975,717
3,975,725
3,975,729
3,975,745
3,975,762
35 : 3,975,698
36 : Re.28,934
3,974,539
3,974,547
3,974,554
3,974,557
3,974,565
3,974,640
3,974,656
3,974,669
3,974,703
3,974,709
3,974,728
3,974,731
3,974,769
3,974,791
3,974,800
3,974,830
3,974,842
3,974,879
3,974,916
3,974,952
3,975,009
3,975,071
3,975,087
3,975,088
3,975,100
3,975,105
3,975,175
3,975,195
3,975,213
3,975,218
3,975,223
3,975,238
3,975,306
3,975,308
3,975,309
3,975,317
3,975,345
3,975,352
3,975,387
3,975,487
3,975,505
3,975,511
3,975,544
3,975,547
3,975,550
3,975,564
3,975,581
3,975,590
3,975,595
3,975,596
3,975,597
3,975,598
3,975,617
3,975,623
3,975,635
3,975,644
3,975,656
3,975,670
3,975,681
3,975,700
3,975,727
3,975,731
3,975,733
3,975,739
37 : 3,974,534
3,974,622
3,974,914

3,975,478
3,975,488
39 : 3,974,553
3,974,586
3,974,590
3,974,659
3,974,661
3,974,673
3,974,674
3,974,694
3,974,700
3,974,831
3,974,835
3,974,865
3,974,867
3,974,870
3,974,887
3,974,910
3,974,924
3,974,951
3,974,953
3,974,965
3,974,991
3,975,027
3,975,031
3,975,047
3,975,059
3,975,079
3,975,129
3,975,140
3,975,145
3,975,165
3,975,176
3,975,201
3,975,203
3,975,210
3,975,251
3,975,256
3,975,290
3,975,297
3,975,315
3,975,329
3,975,331
3,975,336
3,975,356
3,975,359
3,975,360
3,975,392
3,975,414
3,975,416
3,975,444
3,975,467
3,975,489
3,975,491
3,975,541
3,975,556
3,975,558
3,975,559
3,975,572
3,975,574
3,975,578
3,975,616
3,975,682
3,975,693
3,975,738
40 : 3,974,629
3,974,760
3,974,855
3,974,876
3,974,900
3,975,113
3,975,157
3,975,229
3,975,230
3,975,231
3,975,234
3,975,253
3,975,295
3,975,495
3,975,504

3,975,509
3,975,510
41 : 3,974,756
3,974,893
42 : 3,974,540
3,974,544
3,974,574
3,974,589
3,974,594
3,974,611
3,974,615
3,974,637
3,974,643
3,974,644
3,974,645
3,974,685
3,974,695
3,974,698
3,974,711
3,974,712
3,974,764
3,974,768
3,974,776
3,974,780
3,974,783
3,974,822
3,974,823
3,974,840
3,974,846
3,974,850
3,974,883
3,974,907
3,974,943
3,974,954
3,974,955
3,974,956
3,974,962
3,974,963
3,974,978
3,974,992
3,974,998
3,975,010
3,975,020
3,975,042
3,975,044
3,975,045
3,975,053
3,975,114
3,975,149
3,975,188
3,975,211
3,975,212
3,975,215
3,975,233
3,975,250
3,975,254
3,975,259
3,975,261
3,975,263
3,975,298
3,975,322
3,975,332
3,975,346
3,975,355
3,975,380
3,975,412
3,975,420
3,975,421
3,975,436
3,975,438
3,975,439
3,975,447
3,975,457
3,975,485
3,975,514
3,975,537
3,975,603
3,975,643
3,975,646
3,975,658

3,975,692
3,975,694
3,975,701
3,975,742
3,975,758
44 : 3,974,545
3,975,012
45 : 3,974,604
3,974,633
3,974,634
3,974,798
3,975,232
3,975,614
47 : 3,974,940
3,975,119
3,975,500
48 : 3,974,580
3,974,597
3,974,602
3,974,613
3,974,657
3,974,680
3,974,690
3,974,797
3,974,825
3,974,829
3,974,845
3,974,848
3,974,875
3,974,878
3,974,939
3,975,052
3,975,070
3,975,072
3,975,078
3,975,164
3,975,248
3,975,281
3,975,282
3,975,301
3,975,313
3,975,450
3,975,460
3,975,502
3,975,552
3,975,589
3,975,622
3,975,636
3,975,705
49 : 3,975,561
50 : 3,975,220
51 : 3,974,531
3,975,029
3,975,166
3,975,187
3,975,262
3,975,475
3,975,519
3,975,531
3,975,573
3,975,586
3,975,677
3,975,756
53 : 3,974,793
3,974,799
3,974,880
3,974,988
3,975,054
3,975,247
3,975,624
54 : 3,975,650
55 : 3,974,587
3,974,717
3,974,816
3,974,817
3,974,859
3,975,122
3,975,479
3,975,546

Design Patents

1	:	241,059	9	:	240,971			241,029	27	:	241,018			240,990	42	:	241,009
6	:	240,975			241,030			241,033			241,060			240,993			241,021
		241,006			241,058			241,035	29	:	240,976			240,999	44	:	240,982
		241,008			241,062			241,038			240,977			241,007			241,065
		241,015			241,063	18	:	241,082			240,978			241,034	47	:	240,984
		241,020			241,064	19	:	241,041			240,979			241,066	48	:	240,972
		241,025			241,072	21	:	241,004			240,980			241,067			240,995
		241,043			241,080	24	:	241,031	33	:	240,983	37	:	241,027			241,001
		241,045	12	:	241,028	25	:	240,981	34	:	240,987			241,057			241,047
		241,048			241,036			240,992			241,003	39	:	240,991			241,056
		241,052	17	:	240,973			240,998			241,042			241,011	50	:	241,017
		241,055			240,974			241,061			241,070			241,071	51	:	241,053
		241,073			240,994	26	:	240,970			241,075			241,074	55	:	240,986
8	:	241,010			241,000			241,022			241,076			241,079			240,996
		241,019			241,014			241,077	36	:	240,985	40	:	241,024			241,002

Plant Patents

6	:	3,940									

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*